VOLUME LII NUMBER TWO

THE NATIONAL GEOGRAPHIC MAGAZINE

AUGUST, 1927

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TO carry out the purposes for which it was founded thirty-nine years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

TO further the important study of solar radiation in relation to long-range weather forecastings, The Society has appropriated $60,000 to enable the Smithsonian Institution to establish a station for four years on Mt. Brukkaros, in Southwest Africa.

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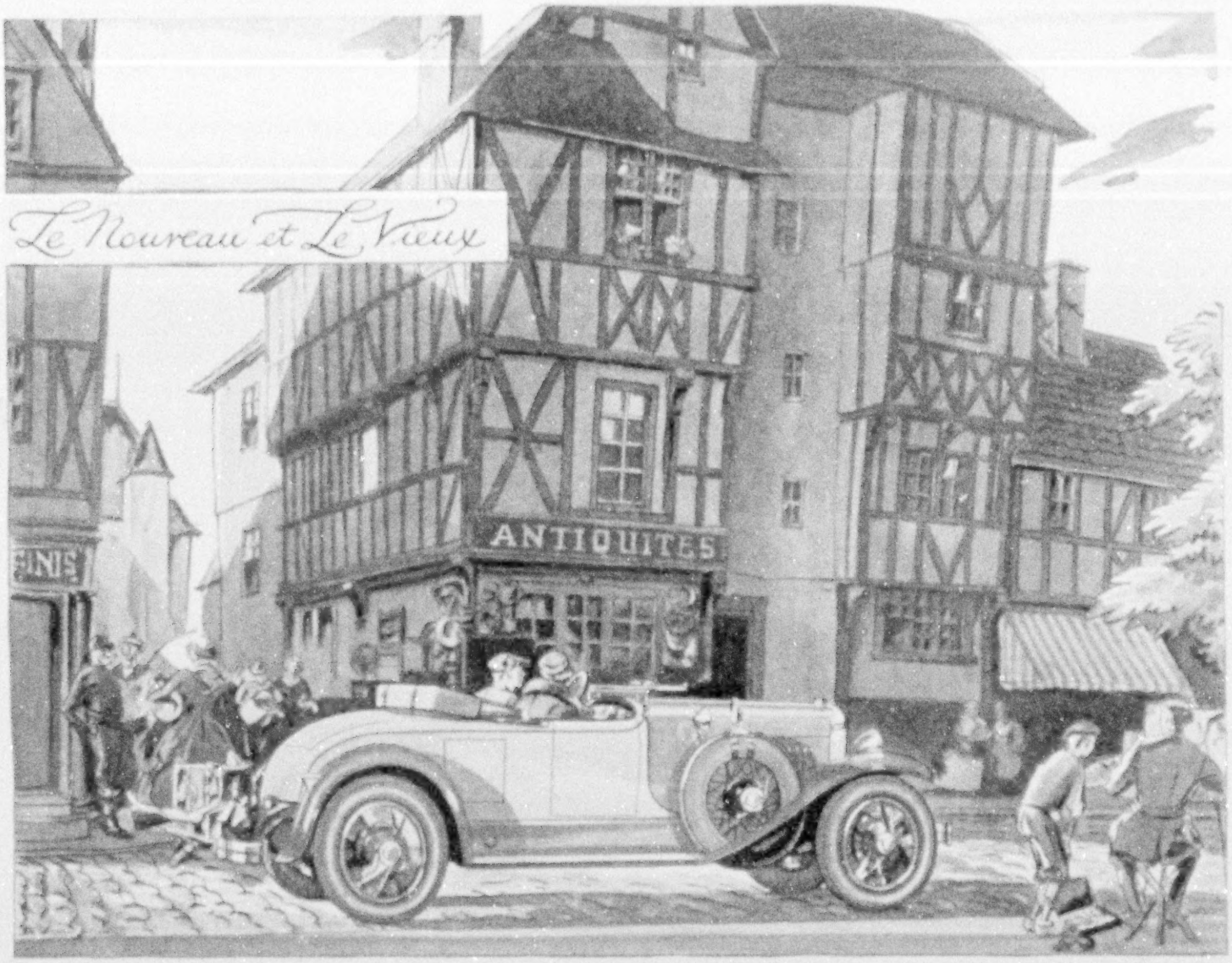

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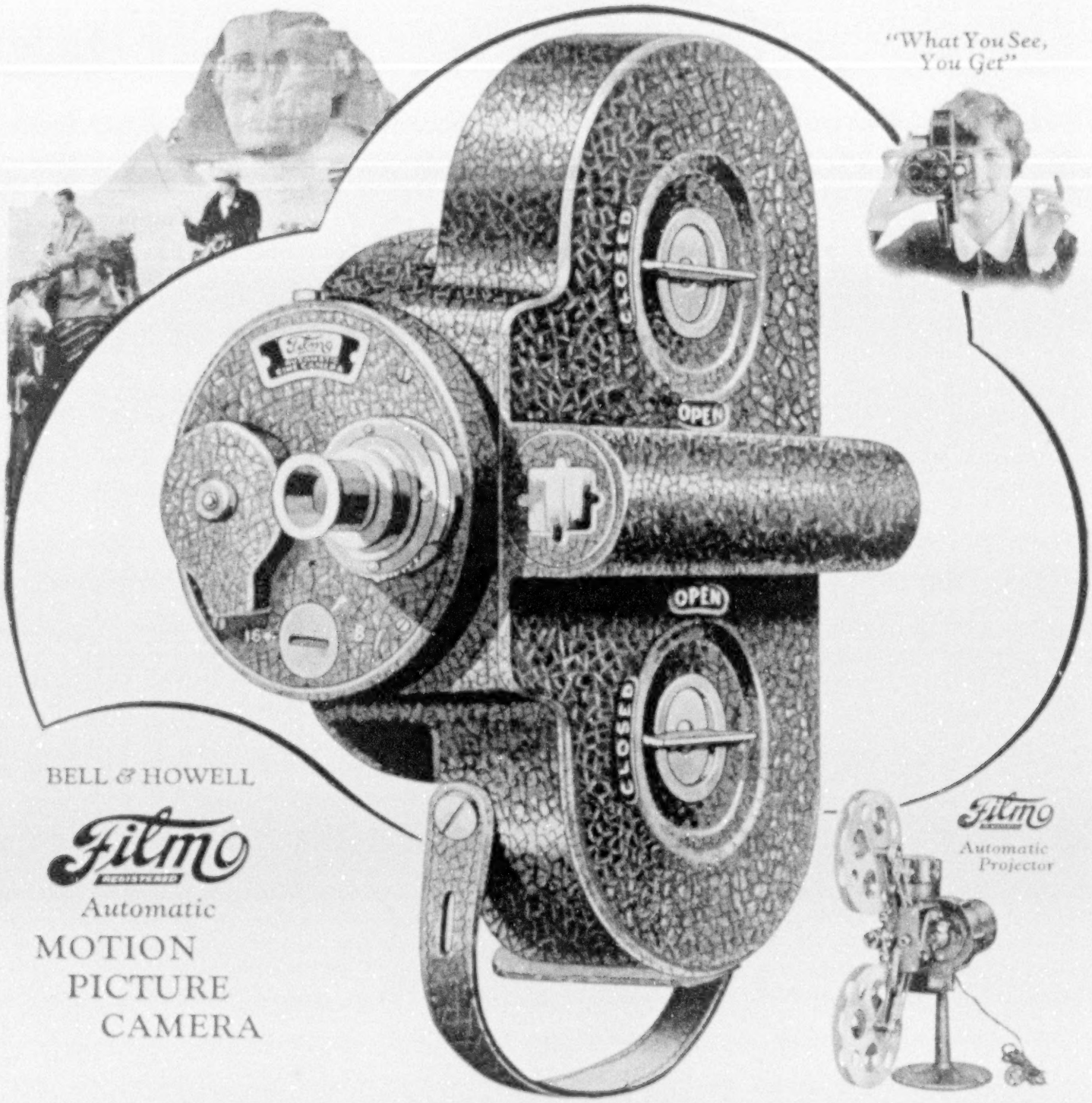

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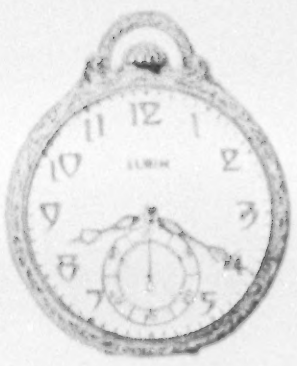

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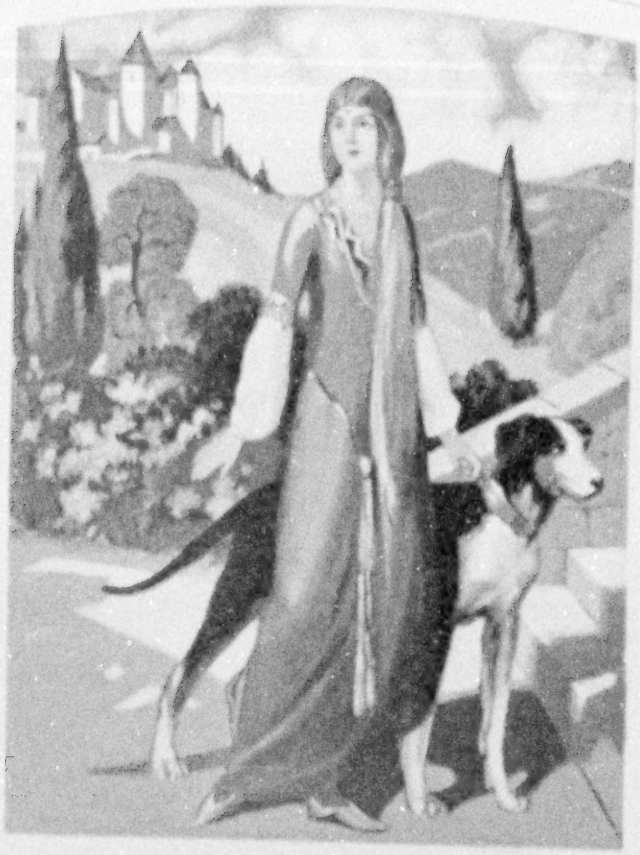

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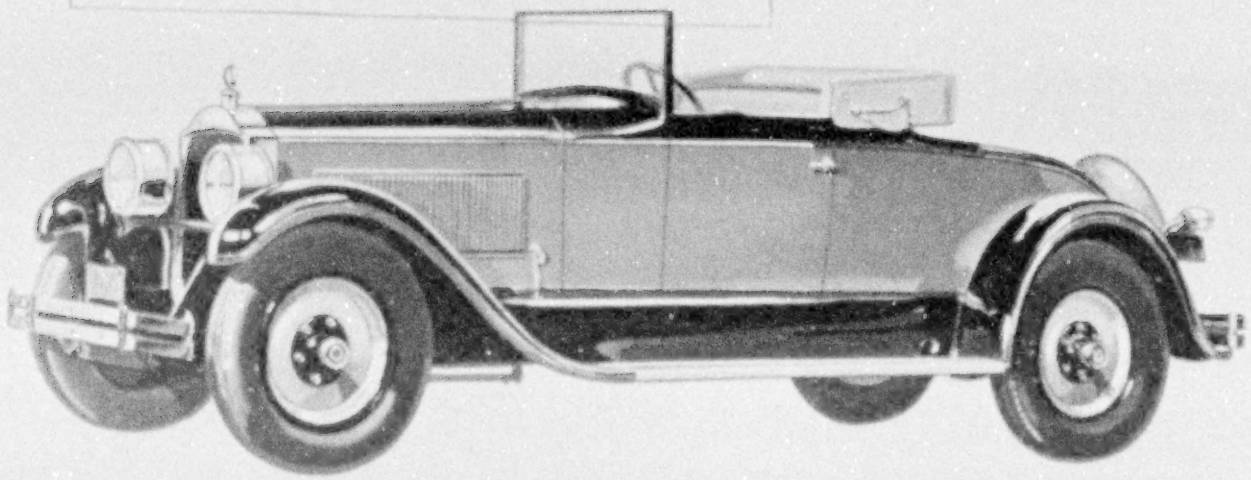

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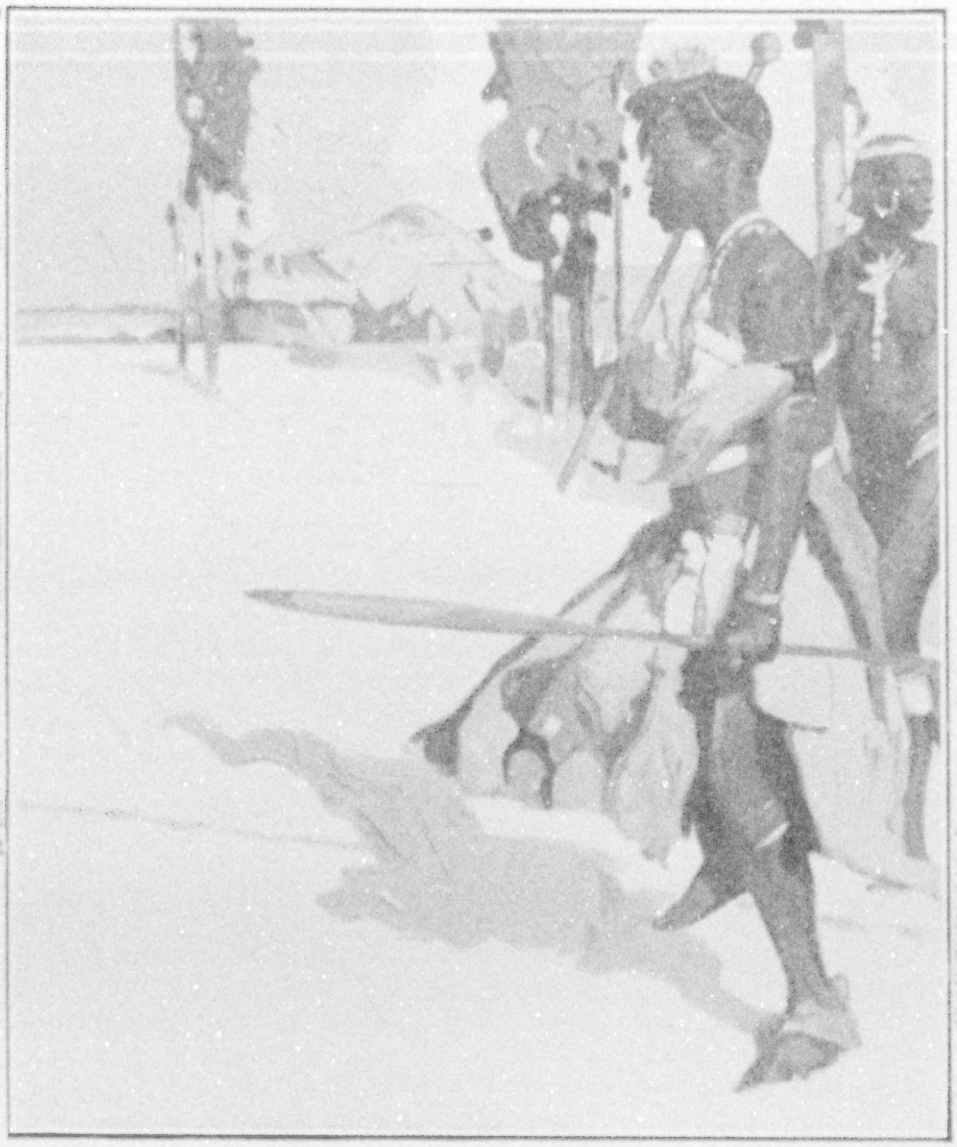

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You loaf into East Coast Harbors, where Arabs dye beards red, and Hindus sell ivory and jade, where slave markets flourished and harems are still an institution.

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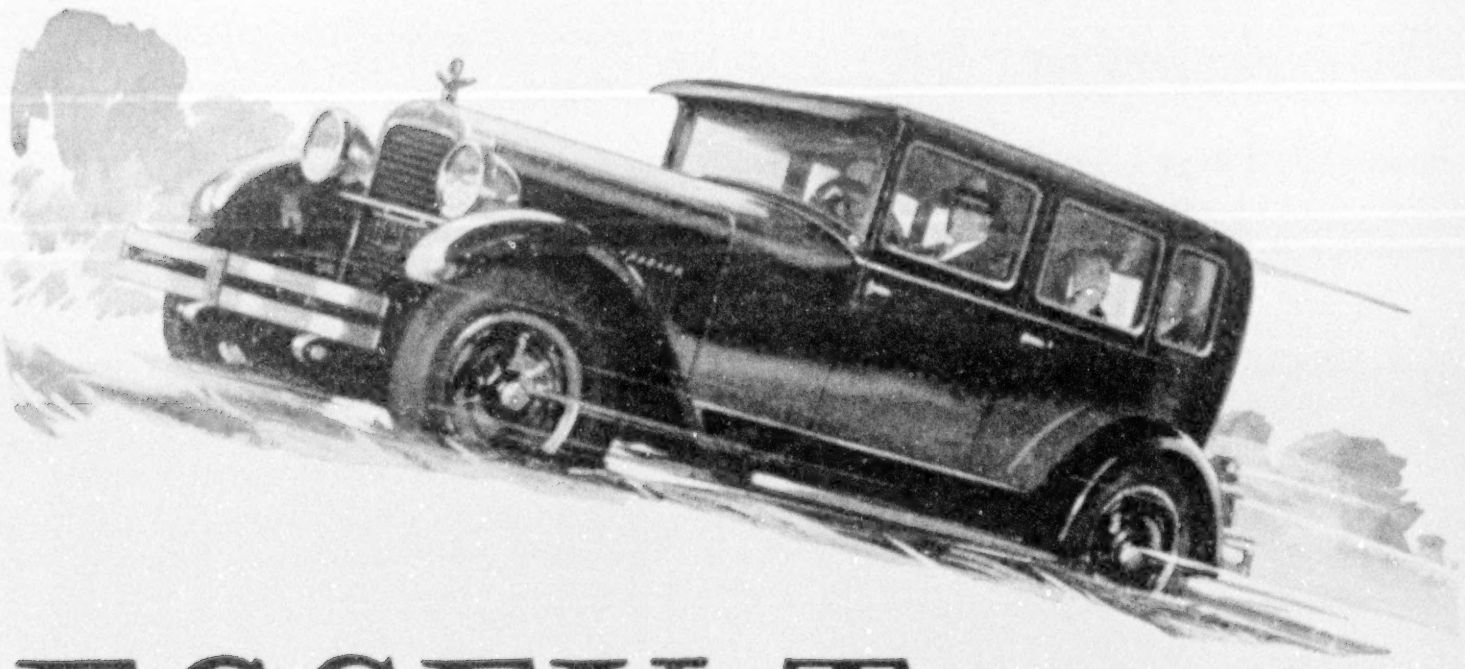

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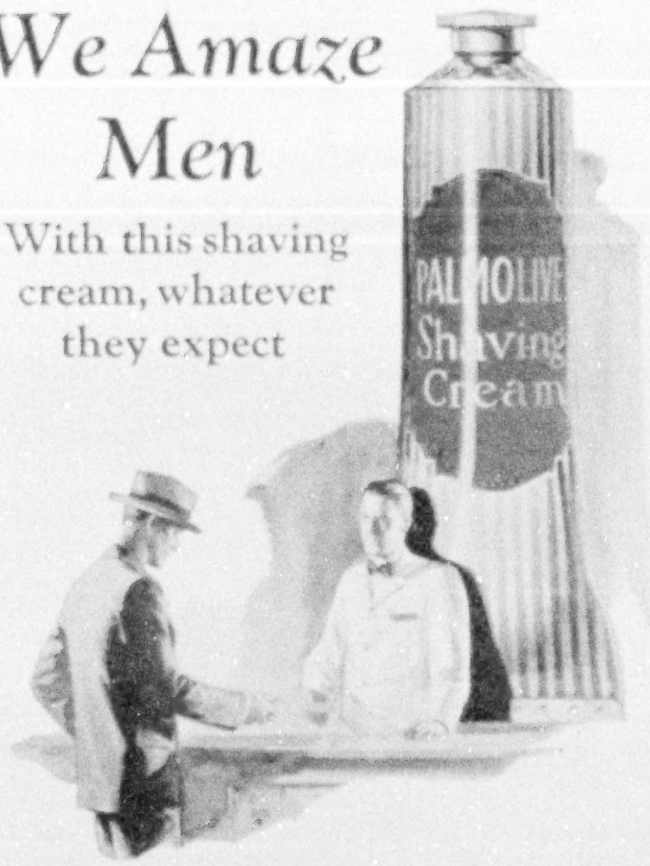

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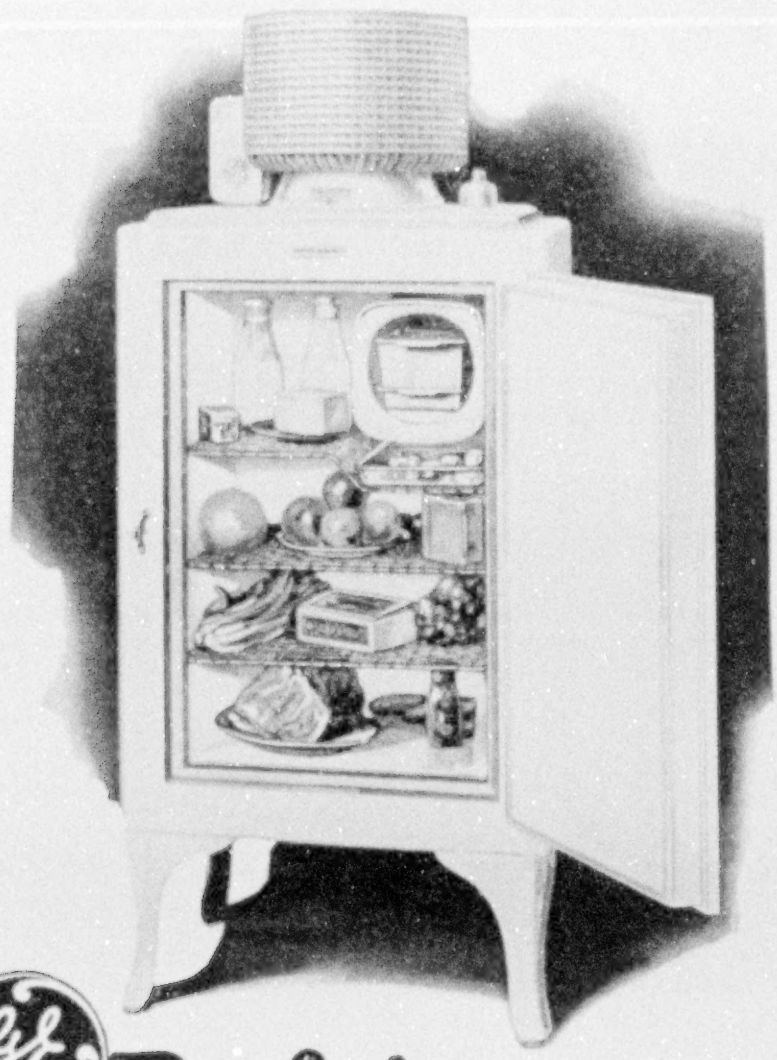

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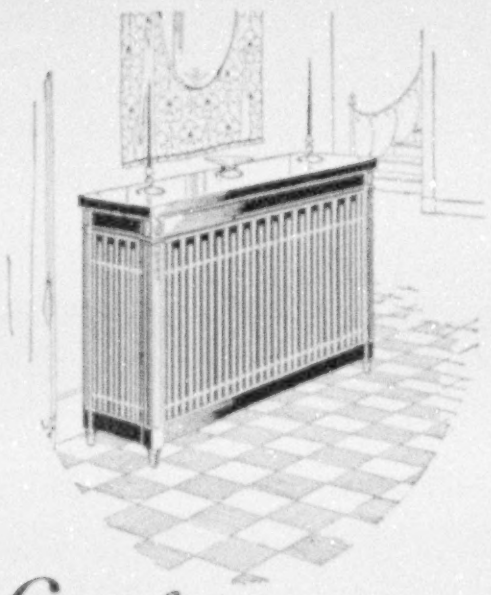

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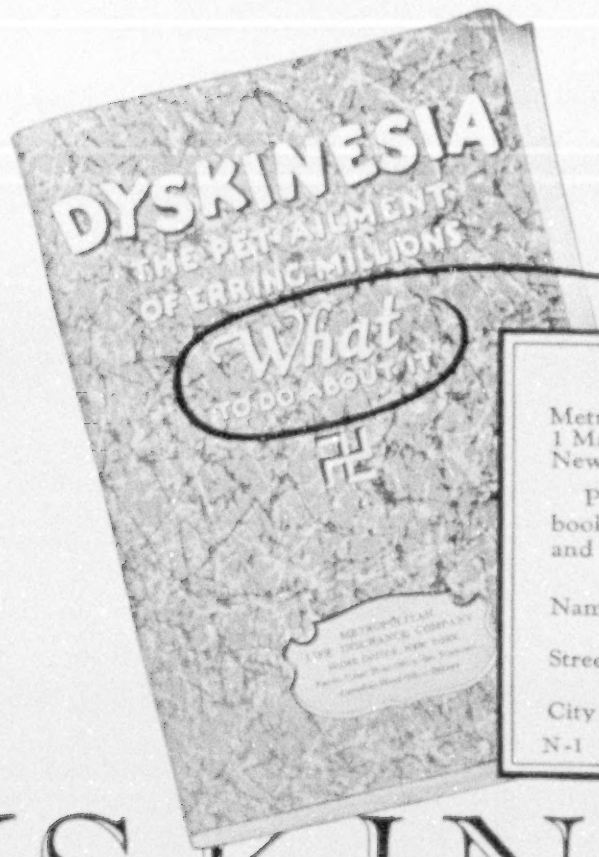

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ACROSS THE MIDI IN A CANOE

Two Americans Paddle Along the Canals of Southern France from the Atlantic to the Mediterranean

BY MELVILLE CHATER

AUTHOR OF "THROUGH THE BACK DOORS OF FRANCE," "RE-DISCOVERING THE RHINE," "HISTORY'S GREATEST TREK," "THROUGH THE BACK DOORS OF BELGIUM," "THE SHORES OF SUNRISE," ETC., ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

With Illustrations from Photographs by the Author

BORDEAUX'S bureaucratic humdrum was suddenly disrupted when, one hot August day, a strange pleasure craft was unloaded on the quay. Although messieurs the customs officials knew the proper duty ratings on boats propelled by steam, or sails, or petrol, they were quite at a loss as to how to rate ours.

In search of a precedent, the scurrying office staff produced weighty tomes from the archives and even forgot to keep alight its cigarettes. Finally the formula for calculating ships' cubic contents was applied to our case and our clearance papers were prepared. They ran:

"The proprietor makes entry of one Canadian canoe, of tonnage 0.03, with two fantastic oars (*avirons de fantaisie*), subject to customs charges following. . . ."

We paid the charges, then a porter carried off our 0.03 ton of canoe on his back, and Bordeaux's bureaucratic calm was resumed.

"Will we have time for a glimpse of Bordeaux before the canoe arrives at its destination?" we asked the railway official who presided over the *petite vitesse*, or slow-freight service.

"But certainly, monsieur," he replied. Now, we were shipping the canoe to a point on the Garonne Latéral Canal, at no great distance from Bordeaux.

"It will take a day, perhaps?" we hazarded. "Eight days, monsieur," he replied suavely.

PLEASURE CRAFT ARE UNKNOWN ON THE GIRONDE

That was our introduction to a phrase which we were to encounter many times. For, whether we wanted films developed, or a suitcase repaired, or boots soled, the native response—implying perhaps that Sundays, holidays, and church festivals were included in the estimate—was a cheerily smiling, "Eight days, monsieur!"

The customs snag over our canoe became comprehensible when we discovered that pleasure craft are unknown on the Gironde. Its 62-mile stretch from the Atlantic to Bordeaux and its radiating rivers and canals, the whole totaling 1,300 navigable miles, are employed almost exclusively for commerce.

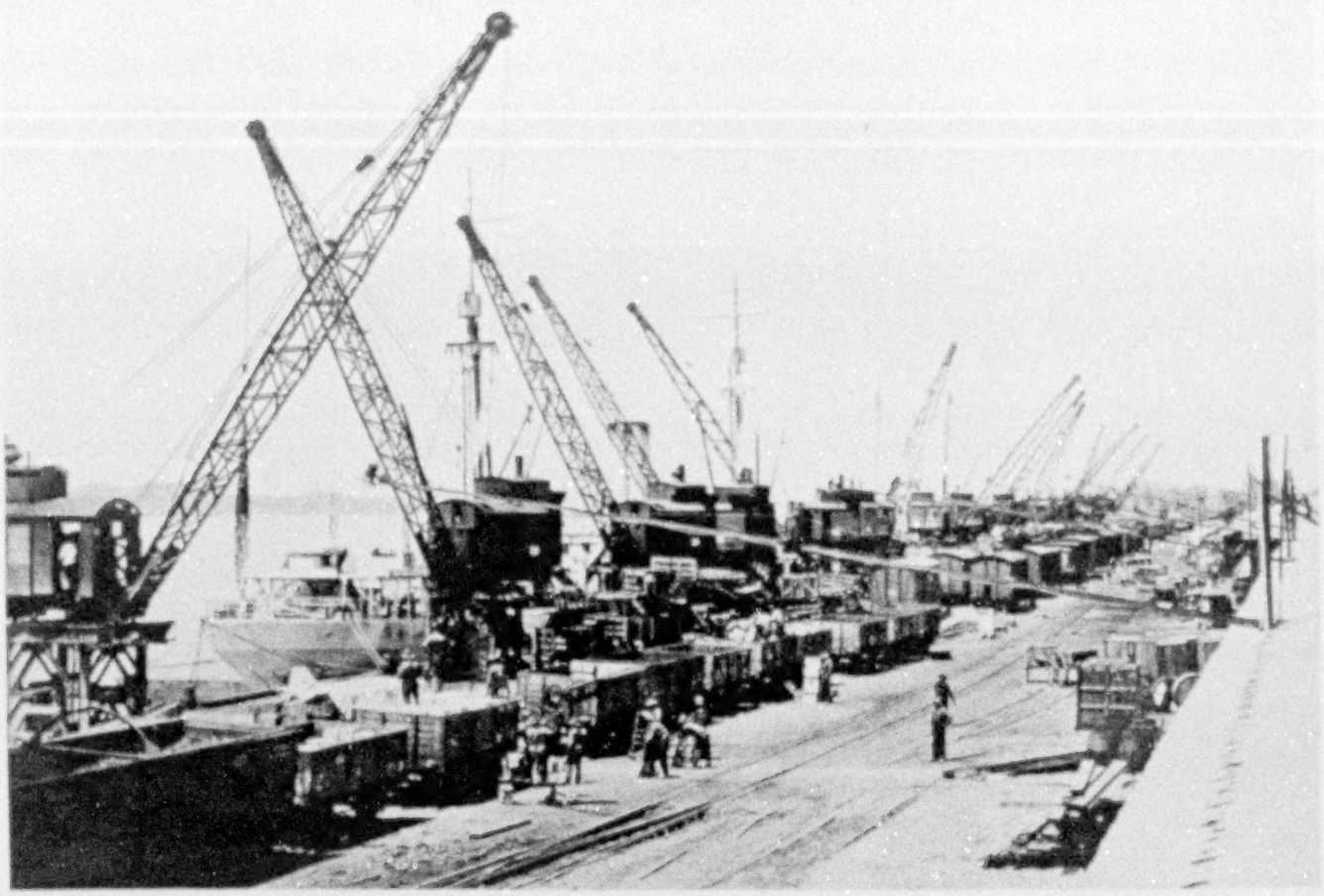
You sense the traditional aspect of importing when you learn that Bordeaux's tall-masted sailing ships still cross to

BORDEAUX'S SIX MILES OF WHARFAGE CURVE ALONG THE BANKS OF THE GIRONDE

This Midi port is one of the few of large size which have troubled to beautify their water fronts. Its broad, quay-paralleling thoroughfare, with tree-shaded promenades and public parks here and there, proves that slummy elements can be reduced to a minimum (see, also, text, page 130). Many of its vessels are engaged in the wine trade, the most important of the port's enterprises, but some of its tall-masted sailing ships still cross to Nova Scotia, as they did in the sixteenth century, to obtain a Lenten supply of codfish.

WHERE HUNDREDS OF THOUSANDS OF AMERICAN SOLDIERS LANDED IN FRANCE

The shipping lines of Bordeaux, 62 miles from the mouth of the Gironde River, diverge to four continents, and the channel is being deepened to accommodate vessels of 28-foot draft. During the World War Bordeaux was one of the eight United States base ports in France, from which thousands of doughboys went forth to write a new chapter in the history of American achievement (see text, page 130).



Photograph Courtesy U. S. Signal Corps

"WHEN OLD GLORY WAVED IN VIEUX BORDEAUX"

The docks at Bassens, near Bordeaux, where Lafayette embarked for America in 1777, were constructed by United States Army engineers, among the first American units to land in France in 1917. Not far from a mile in length and built on 12,000 piles, the docks coördinated with a series of vast warehouses, the largest of which had an area of 135,800 square feet—about one and a half times the size of the former Madison Square Garden in New York City. Note the Stars and Stripes between the cranes at the left.

Nova Scotia for codfish, just as French vessels did in the sixteenth century, to victual the home Lenten season. And you sense its tradition-smashing aspect when you inquire into the imports of American motor cars. For if Rosa Bonheur, herself a Bordeaux woman, were alive to-day, she would probably be painting, instead of her "Horse Fair," an automobile show, and naming it "The Horsepower Fair."

"OLD GLORY WAVED IN VIEUX BORDEAUX"

Bordeaux, with its almost six miles of wharfage, is among the few big ports which have troubled to beautify their water fronts. Its broad, quay-paralleling thoroughfare, with here a tree-shaded promenade, there a public park, and yonder a towering pair of columns dedicated to Commerce and Navigation (see page 131), illustrates for the benefit of many another slummy water front how sea-freighting may bring beauty out of business (see page 128).

Bordeaux! The name will always evoke associations for those hundreds of thousands of Americans who there disembarked on military or auxiliary service. The Stars and Stripes had been a stranger to its quays for 21 years when, in 1915, a vessel arrived with our first war-time cargo for Bordeaux. In July, 1917, its citizens first beheld the disembarking of an American Army unit, a hospital unit, which was followed some weeks later by the 18th U. S. Engineers.

We spent one of our "eight days" visiting the American docks at Bassens, the work of those same engineers. Not far from a mile in length, with 15 parallel tracks in the great receiving yard, these docks coördinated with a series of vast warehouses, one of which, subsequently used for troop embarkations, could shelter 23,000 men (see illustration above).

At the World War's close Bordeaux, of the eight American base ports in France, was handling more than a fourth

BORDEAUX'S ROSTRAL COLUMNS ARE BOTH USEFUL AND BEAUTIFUL

These 65-foot structures, crowned with statues of Commerce and Navigation, overlook the water front and also serve as lighthouses. Bordeaux emerged from the World War with greatly increased equipment for industrial and commercial expansion, for the American Army, practically overnight, completed port facilities which engineers had predicted would take two years to build (see, also, text, page 130).

of the shipments from the United States. Unloading ran as high as 14,000 tons daily. And if you would know what a tidy task Christmas greetings created for A. P. O. 705, the local Army post office, it may be mentioned that in December, 1918, first-class, home-bound mail totaling 44,534,560 pieces passed through its sorters' hands.

To-day, at neighboring Lormont, where once *les dobois Américains* thrashed out jazz on the café piano, the little *place*, with its war memorial of a helmeted swordswoman and the attendant Gallic cock, has relapsed, like Bassens's streets, into humdrum tranquillity. Only the American docks remain like some torn-out page from the great, closed book of American achievement in the days when, as one chronicler has written, "Old Glory waved in vieux Bordeaux."

In somewhat under the Midi's favorite

THE CAILHAU GATE COMMEMORATES A ROYAL VICTORY

This machicolated Gothic gateway of 1495 was built as a triumphal arch in honor of Charles VIII's victory at Fornovo. It is also known as the Palace Gate, an earlier one on this site having been the entrance to the palace of the Dukes of Aquitaine, which was later the seat of the governors of Bordeaux.

eight days the *Nageoma** turned up in a receiving warehouse on the banks of the Garonne Latéral Canal. A glance at her dried-out seams revealed that only a thorough soaking would render her watertight. We instructed monsieur the warehouse boss to launch her immediately; then we went off for our baggage.

*This is the same craft, which derives its name from that of the NATIONAL GEOGRAPHIC MAGAZINE, used by this author in his voyages "Through the Back Doors of France" and "Through the Back Doors of Belgium," described in the THE GEOGRAPHIC for July, 1923, and May, 1925, respectively.

Twenty minutes later, when we regained the canal side, no canoe was in sight. We charged monsieur the boss with dilatoriness. He stared up and down the canal, then exclaimed:

"Extraordinary! I launch that little pickle of a craft, I cross the street for a beer—and now! What devil!"

Apprehensions of canal pirates seized us. We combed the banks, we hailed passing bargees, we enlisted the bicycling canal patrol—all without result. Just as we had given up hope, a scream made us aware that the boss's small son, who was fishing from the quay, had hooked some rod-snapping monster.

"Papa!" he shrieked in the portentously worded French style. "A fish enormous! A fish truly prodigious!"

It took two strong men, armed with boat hooks, to lift out of the water the sunken *Nageoma*. She had gotten her much-needed soaking with a vengeance. But I don't suppose that juvenile fisherman will ever get over his disappointment.

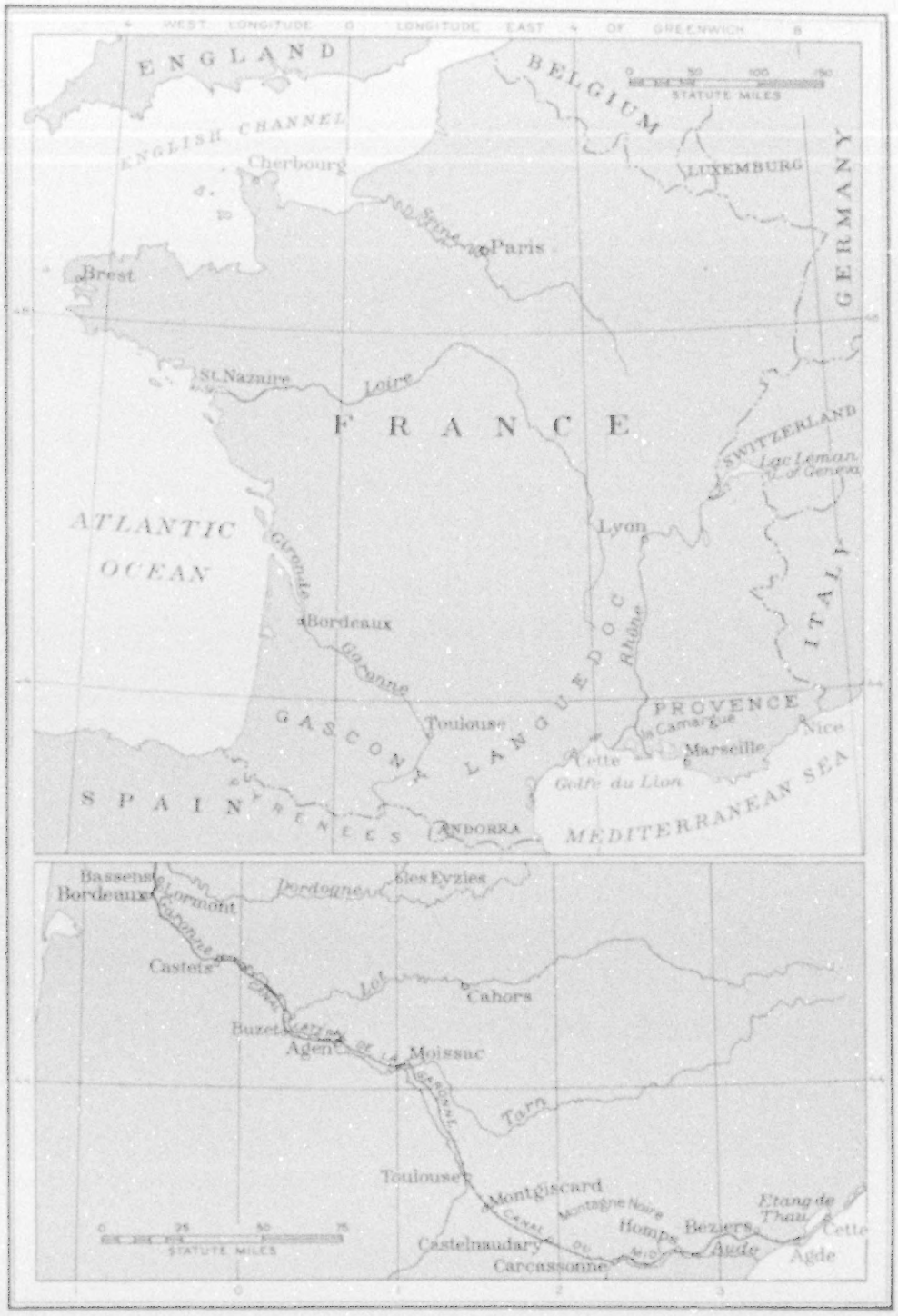
UPHILL AND DOWN DALE VIA CANAL

Next morning we put the canoe in camping condition. We stretched manifold blankets over its 16-foot length of inner space; we laid its rod-supported canvas shelter in shipshape order for setting up at night or during rain. Meanwhile the immediate countryside became denuded of its field hands, who squatted in tiers along the canal bank and took in the show.

"Where go you?" called some one, as we pushed off. It was an inquiry that was to greet us everywhere, and our unvarying reply, "To the Mediterranean," always elicited the same dumbfounded stares. Nobody, unless it were the village idiot, could comprehend the lunacy of paddling uphill and down dale across France (see map, detailed section).

Though navigation hasn't usually much to do with hills and dales, that landsman's phrase aptly describes a canal trip. The 260-mile waterway which stretches from near Bordeaux to the Mediterranean—that is, the conjoined routes of the Latéral and the Midi canals—is regulated by 118 locks. These give a 620-foot drop on either side of Castelnaudary, the highest intermediate point.

Thus, we went "uphill" to Castelnaudary, then "down dale" to the Mediterranean, averaging 10½ feet of ascent or descent each time we passed a lock.



Drawn by James M. Darley

A SKETCH MAP OF FRANCE

The route of the author's canoe, the *Nageoma*, from the Atlantic to the Mediterranean, beginning near Bordeaux and ending at Cette, is shown in the detailed section at the bottom.

The Latéral Canal led us through a smiling countryside of gently rippling hills and of close cultivation, with tobacco plantations and vineyards alternating. Regiments of staked vines aligned themselves across the fields at the queerest of angles, a planting system aimed at securing the maximum exposure to sunlight.

Here and there some picturesque village, its fifteenth-century houses dominated by a ruined donjon, mirrored itself in the Garonne.

The canal and its river feeder parallel each other for 120 miles, and it was but a short stroll whenever we wanted a glimpse of the latter. The fact that their courses intersect at Agen enlivened our voyage with an unexpected "kick."

Our arrival at this crossing occurred one evening when, as the twilit canal led us in between two seemingly endless walls of masonry, the scenery began to drop out of sight. First the trees, then the dim hillsides, sank disquietingly away into nether space. In fact, the canal

FEEDING THE SWANS IN A PARK AT BORDEAUX

Beautiful parks are characteristic of Midi towns, for the hot sun of the region aids the growth of fine shade trees and palmettos. The Public Garden of Bordeaux, laid out by the Marquis de Tourny in the eighteenth century, is the finest promenade in the city and consists of a *Parc Anglais* and a well-stocked botanical section. A statue to Rosa Bonheur, the noted Bordelais animal painter, stands on the park's terrace.

seemed to be conducting us to the only thing that wasn't sinking, the rising moon. It felt alarmingly as if the bottom had dropped out of the universe.

"Set me ashore!" came a demand from the bow. But where was the shore? We gained the stone quay and peered over its breast-high embankment. Far below us lay a wide valley where, as distant sounds hinted, a river was rushing. Ours didn't seem exactly a homelike locality for camping, so we continued paddling for another ten minutes of aërial-aquatic travel until, to our relief, we reached terra firma and Agen's welcoming lights.

Revisiting the spot next morning, we found that what we had crossed was the canal-carrying aqueduct which floats barge traffic high in air across the wide valley of the Garonne (see, also, illustration, page 158).

GOOD CHEER CHARACTERIZES THE MIDI

Of the Midi's back-doors country, that blessed, unpretentious region of escape from conventional touring, Agen is a memorable example. You are jolted by horse-omnibus over its cobbled ways to a veritable, old-fashioned inn, in whose central courtyard the imposing vehicle is stalled. You discover simplicity, cheer, and the kind of host who personally welcomes the guest and sketches tempting menus—the matter of a sole, the advisability of a *foie gras*, the precisely appropriate wine.

You sleep beneath billowings of eider down, and awake to the clack-clack of sabots in the courtyard, where mine host is bargaining for the enormous lettuces and craning geese that stuff the peasants' baskets.

The sequel to this delightful experience, for it was ours, arose from our inquiry as to what we should see in that region. "Something historical," we explained to our host, "something really old, you know."

"Really old?" He pondered, this pleaser of palates. How best assuage two

VILLAGERS ADMIRING THE FREAK PLEASURE BOAT

Rudderless, motorless, sailless, without oarlocks or keel, the *Nageoma* never failed to excite wonderment, for the little "pickle of a craft" was of a type unknown to the commerce-carrying canals. Three feet at each end of the 16-foot canoe were allowed for storage.

MAUD MÜLLERS OF THE FRENCH HAYFIELDS

Few women surpass the French in unremitting industry, and an enormous amount of manual labor falls to peasant wives and daughters whenever a bountiful harvest necessitates all hands taking to the fields.

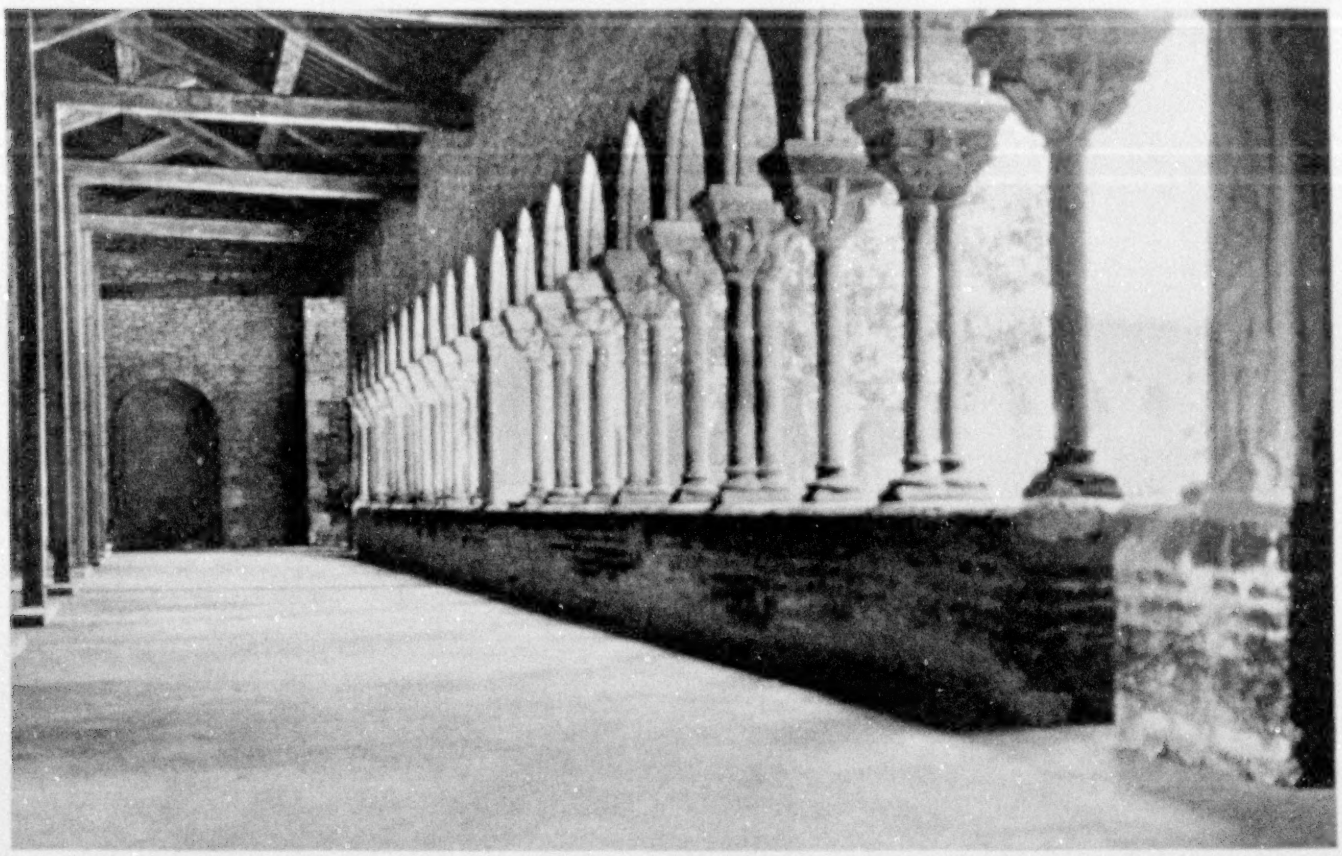
MAKING HAY WHILE THE SUN SHINES

Farm labor is scarce in the Midi, in part because of the loss of man power during the World War. At harvest time large numbers of Spaniards and Italians cross the French borders to get work.

Photograph by l'Abbé Henri Breuil

PROMONTORY ROCK OF FONT-DE-GAUME, SEEN FROM THE BEUNE RIVER VALLEY

The Cavern of Font-de-Gaume, not far from Les Eyzies, is under this rock. It contains one of the most complete records of Upper Paleolithic art, parts of the wall surfaces being crowded with engravings of animals.



MOISSAC'S CLOISTERS CONSTITUTE CHURCH HISTORY IN STONE

This twelfth-century structure is among the finest in France. The columns supporting the 76 pointed arches are alternately single and double, and are crowned with capitals graven with scenes in which popes and cardinals figure (see text below). At each angle of the cloisters and at the middle of each side rise square piers bearing reliefs.

Americans' thirst for the antique? "You should visit Les Eyzies!" he exclaimed. "Oh, it is very ancient, very interesting, monsieur!"

Accordingly, we entrained for Les Eyzies. We anticipated quaint cross-beamed houses, possibly hoary towers with candle-snuffer tops, cresting a medieval village. Yet Les Eyzies, though picturesque, proved dismally new. We put questions as to the whereabouts of its ancient habitations and received puzzled stares.

"Ancient habitations?" It was the postmaster who finally had the happy inspiration. "Ah, you mean the grottoes?" It was now our turn to stare.

"Grottoes? But are they historic, really *old?*" we persisted.

"I assure you!" came the response. "The messieurs the cavemen inhabited them in—how is it called?—the Stone Age."

SEEKING THE HAUNTS OF CRO-MAGNON MAN

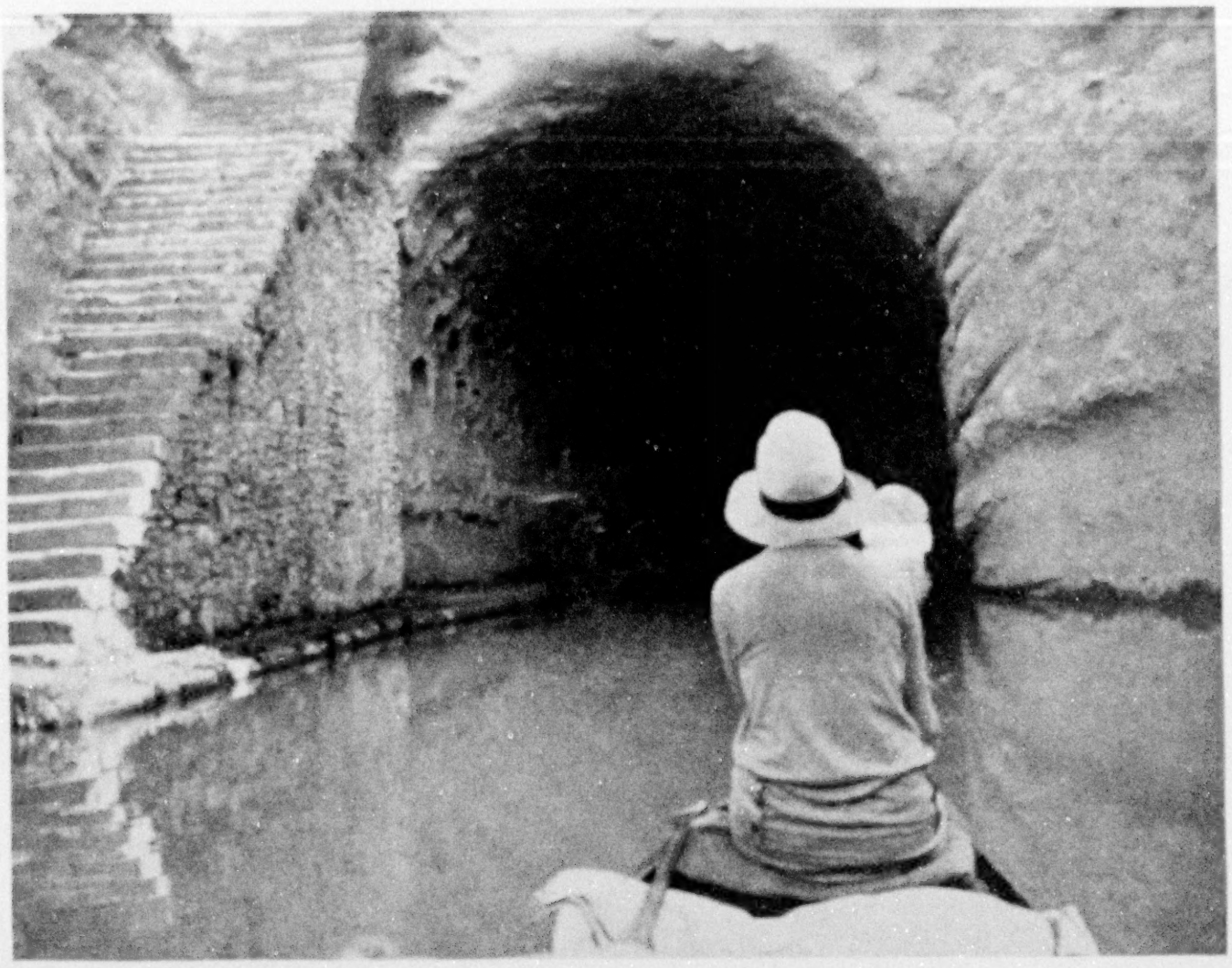
Humbly we made pilgrimage to the habitations of Pleistocene man, and for a while our New World thirst for the antique was assuaged.

It was in the early sixties that Les Eyzies' grottoes yielded finds of flint and horn implements, human skeletons, and bones of extinct animals. Subsequently these formed a basis for calculating the chronology of the Stone Age. And in 1868 the so-called Cro-Magnon Cave yielded skulls which, according to some anthropologists, represent a race, the Cro-Magnons, that inhabited Europe during the Pleistocene period.

MOISSAC'S CLOISTERS RIVAL ANY TO BE FOUND IN FRANCE

Between the rude representations of animals, scratched by primitive man on his cave's walls, and the art which caused Moissac's cloister columns to bloom with flowerlike beauty, lies all the mystery of the timeless miracle of mental evolution.

We came to Moissac through a pretty countryside of haymaking scenes and red-roofed farmhouses. Here the sinuous canal hardly permitted even a canoe to squeeze between the monster barges



THE MIDI CANAL ENTERS A TUNNEL

French canals are idyllic streams of sylvan windings innumerable, of bank-bordering trees a-march against the sky, of woodland-embowered bridges dipped in the mirroring vista, of compositions framed in the arch of an antique bridge (see page 154). The Midi Canal runs through a series of tunnels and also over several aqueducts (see text, page 133, and illustration, page 158).

pyramided with wine tuns for Bordeaux, the western Midi's wine center.

Surely it was by a sheer prodigality of the religious art impulse that Moissac, a mere rustic townlet, became dowered with twelfth-century cloisters which rival any in France! Their column capitals, graven with many a scene in which popes and cardinals figure, constitute a veritable church history in stone.

Less comprehensible are the bizarre coursings of rats and other animals which early carvers, at Moissac as elsewhere, mingled with religious themes. St. Sernin's choir stalls, at Toulouse, even display a pig in a pulpit. This is commonly said to represent Calvin. With equal impossibility of proof or disproof, one might say that Apollo Smintheus, shown on ancient coins with a mouse in his hand, was the remote ancestor of Hamelin's pied piper!

The fact is, religious art has mingled beasts and gods since high antiquity. Whether or not these beast themes, like the satyr and faun, symbolize primitive man and his instincts, the habit goes back to primitive man himself, and to the pictured bison and reindeer he scratched on his cave's walls.

Long before we gained the Canal du Midi at Toulouse we had learned how vividly the French for "midday" describes Pyrenean France. One's abiding recollections of the Midi are of the midday—withering heat, whitish, fast-shuttered houses, whitish roads, dust-blanched fields and foliage—all under a cloudless, turquoise sky whose fires light the peasant's bedtime hour.

And so we hugged the canal's shady side and vented our feelings by declaring rashly that the Midi noon lasted, say, from 11 a. m. to 4 p. m.

MIDI VINEYARDS SUPPLY THE BARGEE WITH MANY CARGOES

All the provinces of southern France produce their own wines, some of world-wide fame, like those of Bordeaux, and others little known except in their own districts.

THE LATÉRAL CANAL BISECTS MOISSAC-ON-THE-TARN

The canal here is sinuous and sometimes so crowded with great wine barges that even so small a craft as a canoe can hardly squeeze past. Moissac housewives use the canal for a washtub.

Photograph by Maynard Owen Williams

MINDING HER OWN KNITTING

Over her clicking needles, this market woman of Toulouse keeps an eye on a lot of air done up in casings which will one day confine sausage and garlic. Despite the betraying charm of its name, her native city sprawls commonplace and disconsolate-looking at the junction of the Latéral and Midi canals, the former built in the nineteenth century to avoid the difficult stretches of the Garonne.

Toulouse—alas for the betraying charm of its name!—sprawled before us commonplace and disconsolate-looking, as if depleted by centuries of sunstroke. Of the medieval city that was the seat of a powerful countship and the scene of religious wars, little remains but St. Sernin's Romanesque pile, named for St. Saturninus, who was dragged behind the bull he had refused to sacrifice on Jupiter's altar, to recall Toulouse's architectural past.

TOULOUSE'S FLOWER FESTIVAL DATES BACK 600 YEARS

With one other exception what the visitor would expect of that high-sounding name is discoverable only in histories.

This exception is the curious spectacle of forty citizen patrons receiving nine gold and silver flowers from La Daurade's high altar, then defiling through Toulouse to award these artificed amaranths, marigolds, and other blossoms in a poetry contest, and finally hymning a eulogy on the festival's reputed founder, Dame Clémence Isaure.

Such is the May Day fête of the ancient Académie des Jeux-Floraux. While floral festivals of varying kinds are held at Nice, Cahors, Lyon, Cette, and in Normandy, Catalonia, and Rhenish Prussia, it is only the Toulousain event which represents an unbroken tradition of six centuries' span.

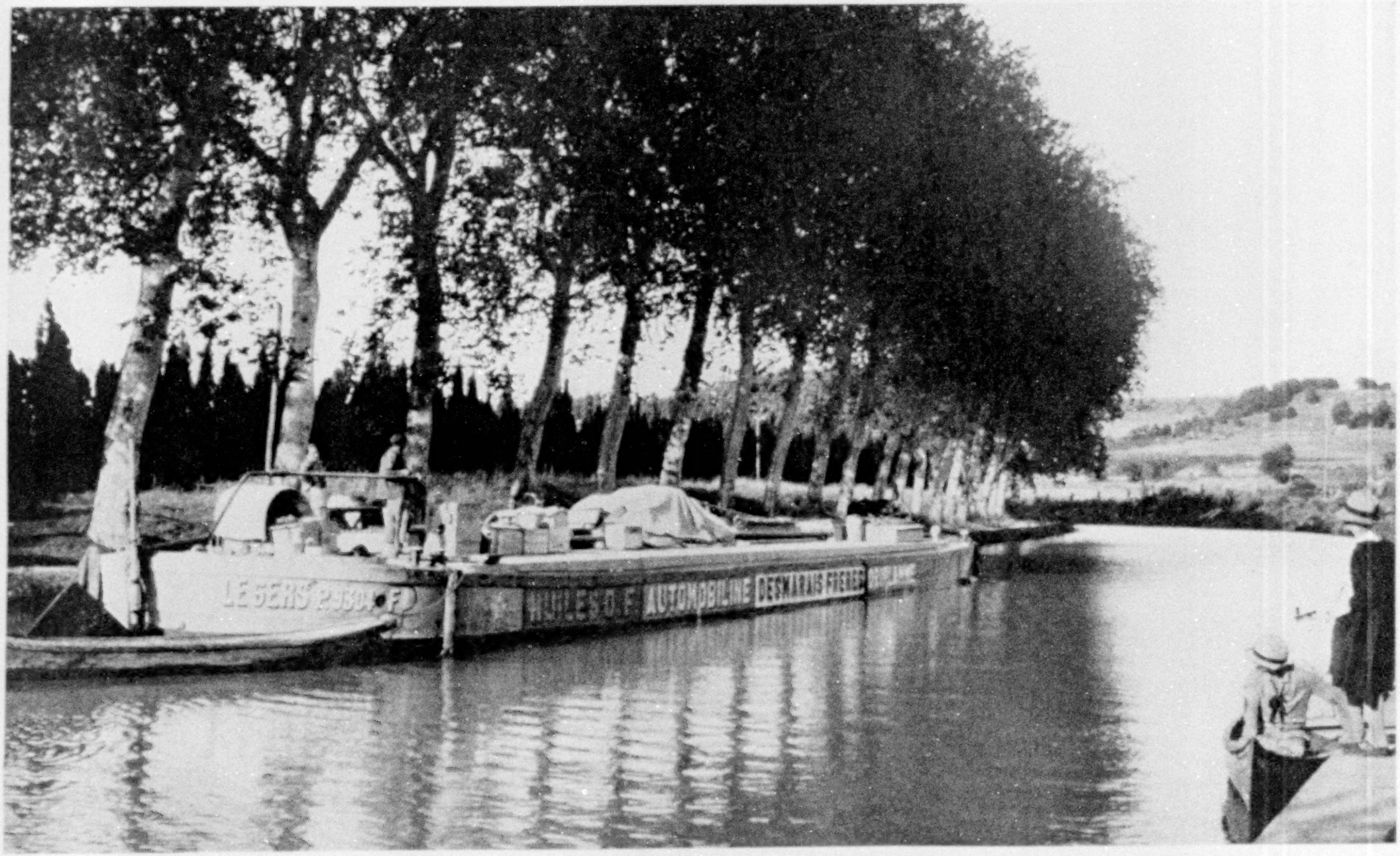
Strollers in the Luxembourg Gardens at Paris will find there an edifying statue of laurel-crowned, lyre-strumming Dame Clémence. Unfortunately for her laurels, modern scholarship has denounced the dame as a 400-year-old myth. It is to be remembered that her tradition is traceable to an age when poets hymned ideal, entirely imaginary mistresses in their verse.

The festival's origin, antedating Dame Clémence by 200 years, harks back to the beginning of the fourteenth century. The Midi's great literary flowering had with-

Photograph by Lewis W. Hine

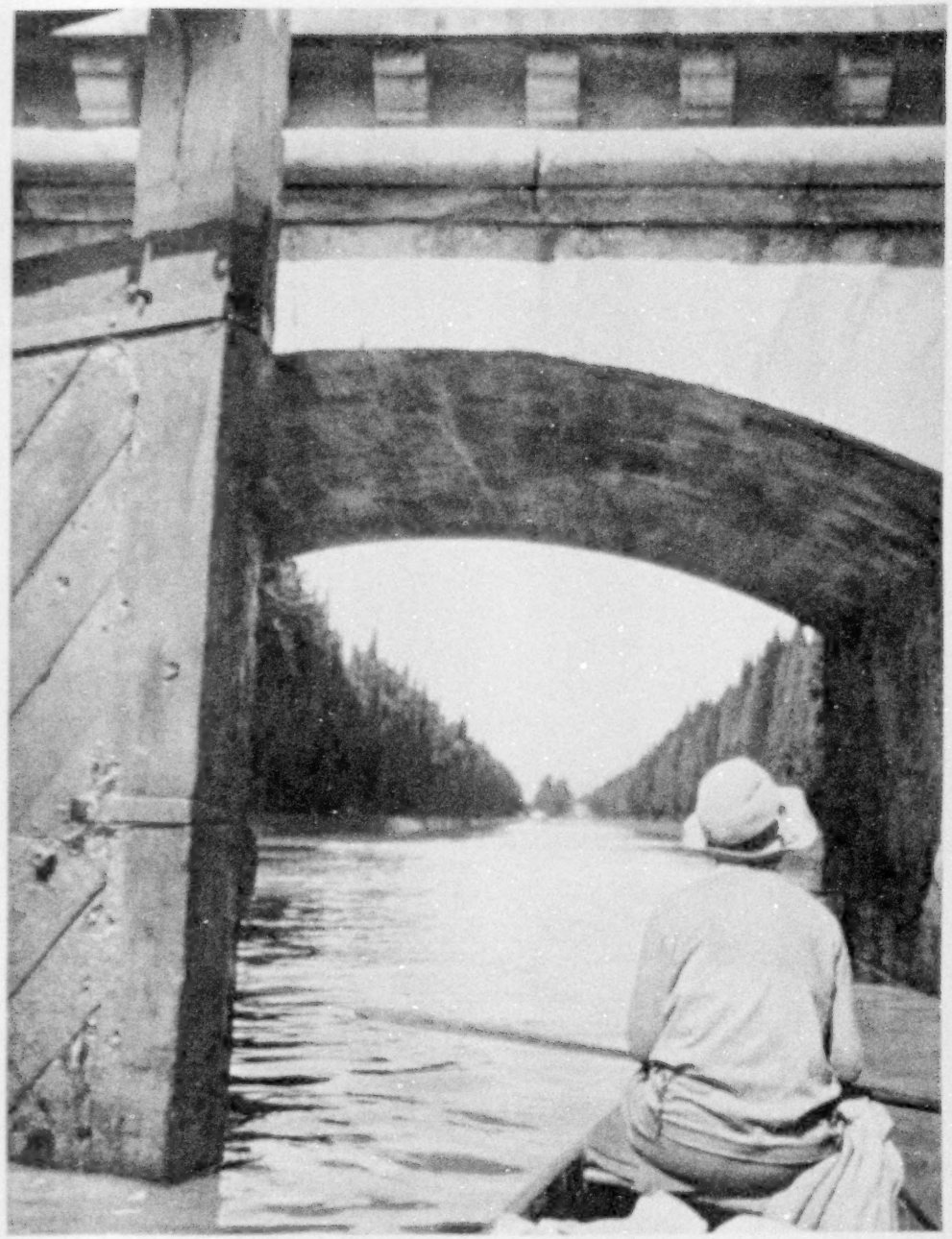
THE SEASONED VINTAGE OF A TOULOUSAIN SMILE

Like Henry James, many visitors to Toulouse have a strong desire to talk with the inhabitants "simply for the entertainment of hearing them reply with that curious, that fascinating accent of the Languedoc." This harsh-sounding Romanic dialect is difficult for the uninitiated to understand, but luckily the Midi's natives are bilingual (see text, page 152).



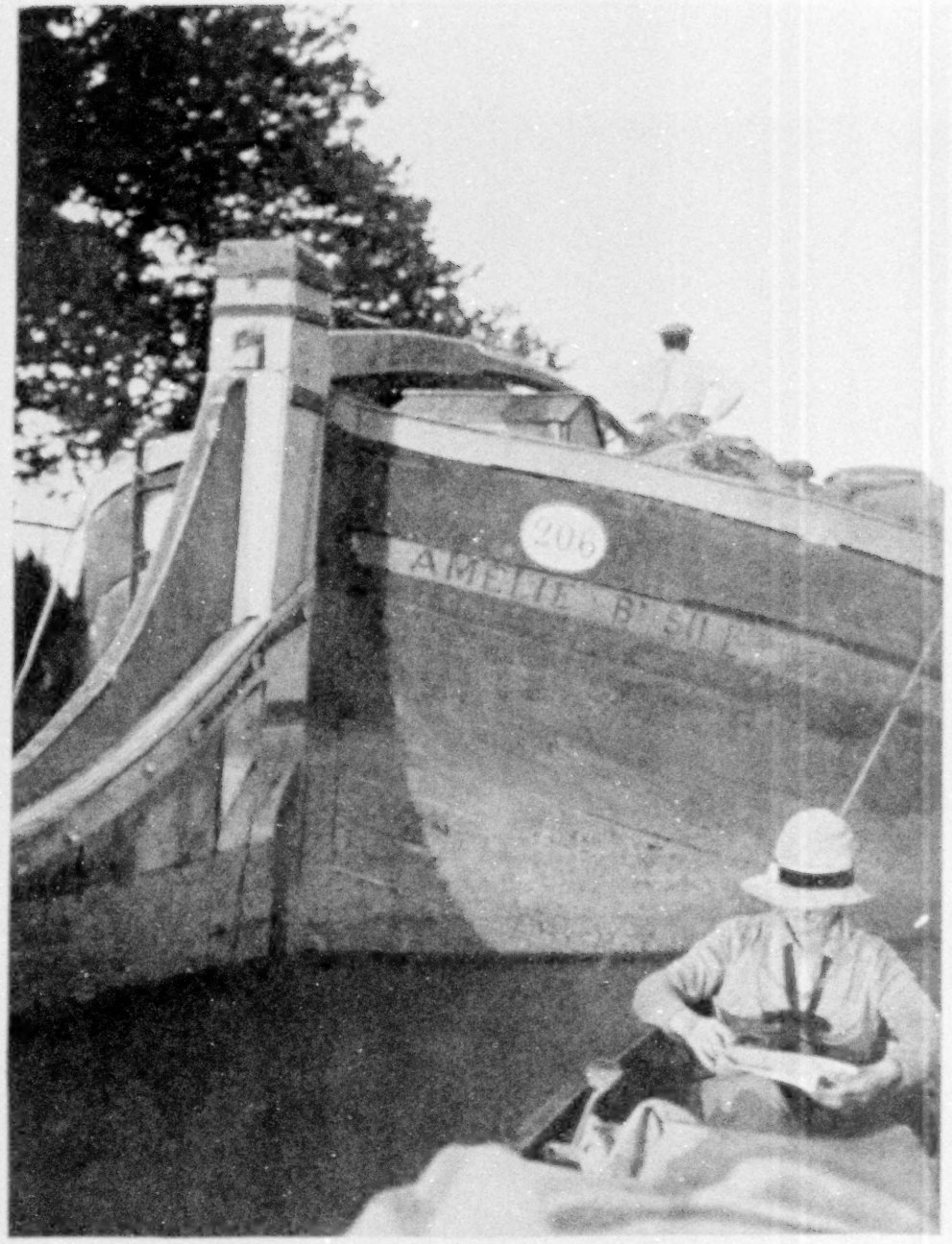
THE CANAL DU MIDI TRAFFICKS IN OIL AS WELL AS WINE

Midi waterways are not only bearers of commerce, but often the coolest spots in this region of withering heat. They are, therefore, "social centers" for the small communities roundabout, which at festival times hang the banks with Japanese lanterns, listen to band concerts, and witness exciting contests of water polo.



UNBROKEN MILES OF TREES SHIELD THE CANAL FROM SWEEPING WINDS

"Here are venerable oak glades, there alleys of plane trees, and yonder spear-straight pines or somber walls of cypress" (see text, page 148). Often ranks of the different species parallel each other in a multiplied depth of sylvan shelter for barge traffic.



SKIPPER PIERRE, OF THE "AMÉLIE," GIVES THE "NAGEOMA" A TOW

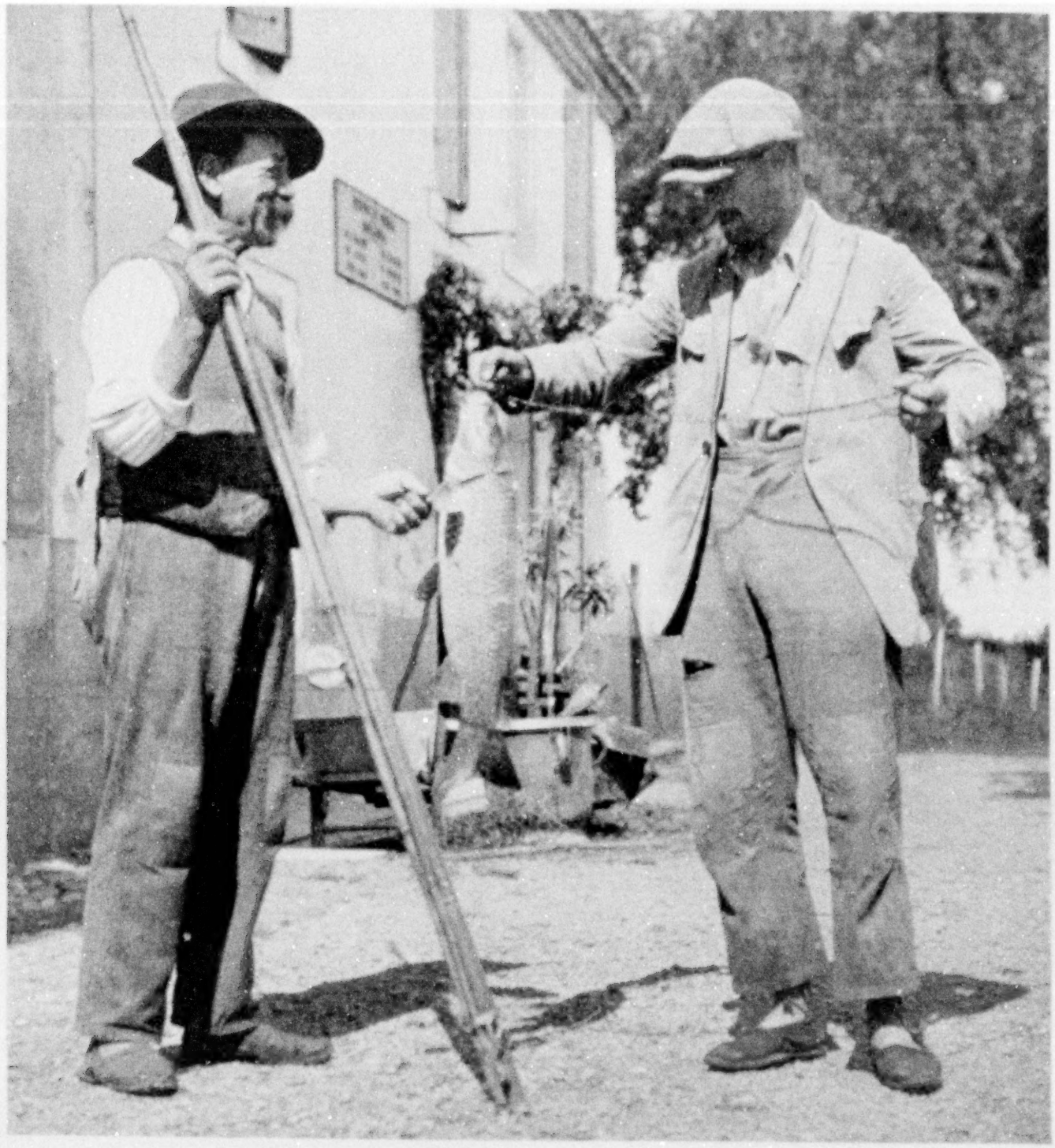
This Midi bargee had a peculiar method of forecasting storms out of cloudless skies. The canoeists finally coaxed him to reveal the secret of his prophecies, for the advancement of meteorological "science" (see text, page 166).

ASKING THE WAY

Midi women wear a white straw hat with black velvet crown and black velvet ribbons.

MAKING A WAYSIDE DEAL IN TOMATOES FOR THE CANOE'S LARDER

Sometimes the line of supplies is threatened by the exodus of every villager to the vineyards during the harvest season, for many a good cock works in the fields until 10 at night. The author found vegetables scarce, for grapes were the peasants' money crop.



A PISCINE DREAM COME TRUE

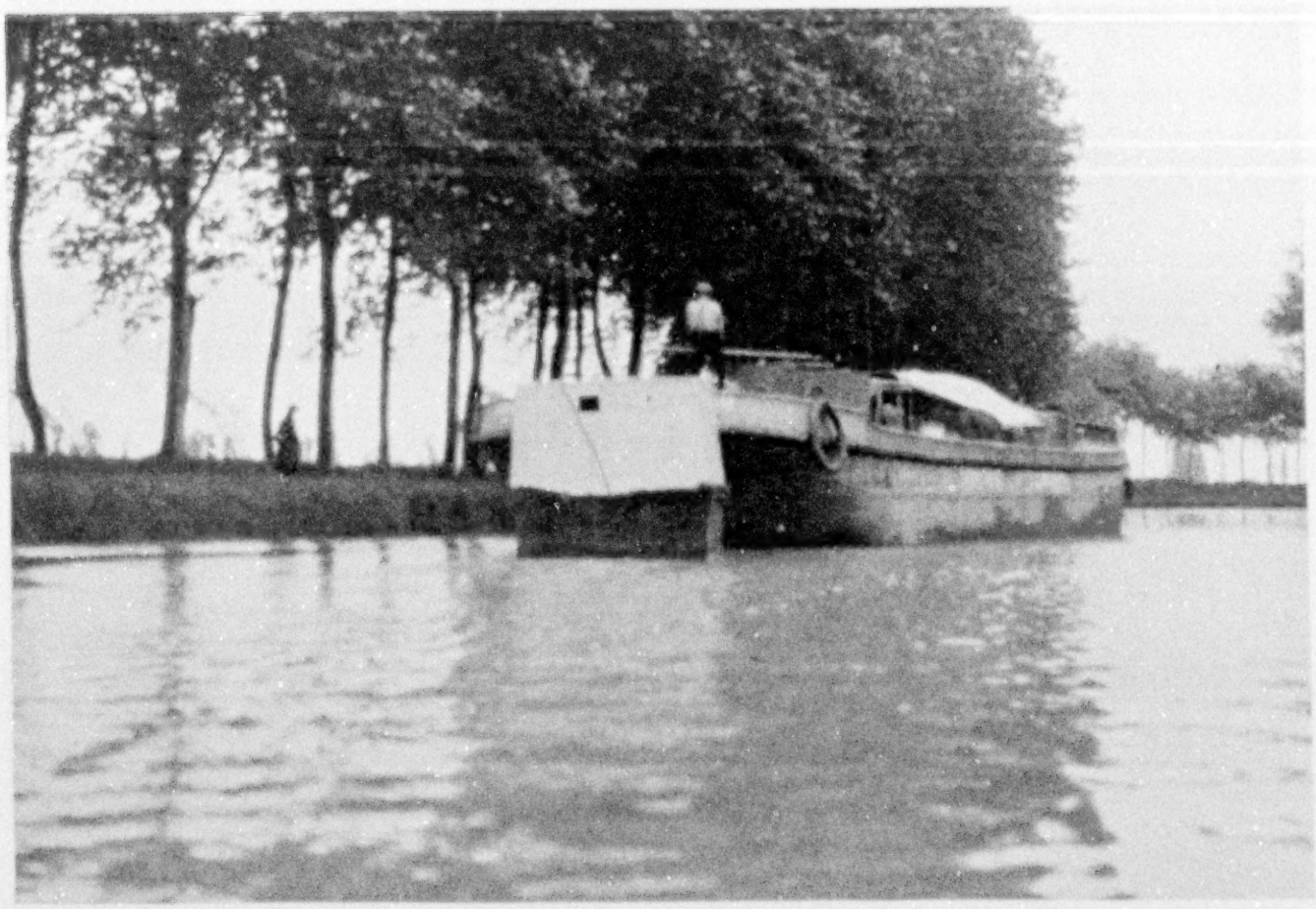
This seven-pound catch from the Canal du Midi proves the eminent "fishability" of this and other French canals, along whose banks anglers squat in endless procession.

ered under religious wars, and Dante lay dying at Ravenna, when seven modest troubadours of Toulouse met under a laurel tree to reillumine poesy's failing torch.

They were all what is commonly called "in trade," except for Bernard de Panassac, who combined the gentle callings of poet and highwayman. Their versified invitation to all brother-bards in Languedoc, or, as they put it, "in the langue d'oc," urged them to assemble annually on May Day to recite their compositions, "so that the world shall be gayer and the poets better."

(It was Dante who, contrasting the speech of northern and southern France by reference to their respective words for "yes," had described the former as the *langue d'oil* (tongue of *oui*) and the latter as the *langue d'oc*.)

The budding academy codified its standards in what it called "the gay science"; it created honorary titles and established the giving of golden violets as awards. Thus was the Midi's poetic



A FLOATING STABLE FOR THE "AMÉLIE'S" FOUR-HOOFED TRACTOR

"At sunrise we perceived a big barge, with a boxlike construction swinging at its stern. . . . The skipper led a horse out of the annex, which proved to be a floating box stall, hitched him to the towrope, and the day's work began" (see text, page 148).

art determined for centuries to come, and thus the oldest literary society in France, in Europe, possibly, was founded by "the very gay Company of the Seven Troubadours of Toulouse."

THE TOULOUSAINS SHOW ARTISTIC ENTHUSIASMS

It isn't surprising that, with such traditions, modern Toulousains should have strong artistic enthusiasms. We discovered as much at the canal side, when we gave the *Nageoma* a coat of paint. For traffic obstruction, Tom Sawyer's whitewashing bee was nothing to it.

Six black-smocked urchins dashed up. A postman paused. A gendarme and a fireman stood rooted. A *laitière* halted her milk cart. A priest neglected his missal reading. Various sniffing dogs came off with bright-green noses.

Vainly we urged, with the modesty of true artists, that we preferred solitude. Everyone was itching to paint or, at least, to stir the paint can.

Meanwhile women, leaning out of upper windows, yelled, "*Laitière*, do I get any milk to-day?" or, "Postman, bring me my letter!" or, "Fireman, there's a blaze in the next block!"

At Toulouse we left the Latéral Canal and entered the much older Canal du Midi. Constructed in 1666-1681, this "canal of two seas" represents the earliest step toward the present Atlantic-to-the Rhône line. Beyond that 320-mile route extend the Rhône's northern canal connections whereby barges can travel inland from Bordeaux to French Channel ports.

The most recently completed canal link in southern France has opened a Marseille-to-Calais line. This is 852 miles long, or considerably shorter than the sea route.

THE MIDI CANAL IS ONE OF THE LOVELIEST OF FRENCH WATERWAYS

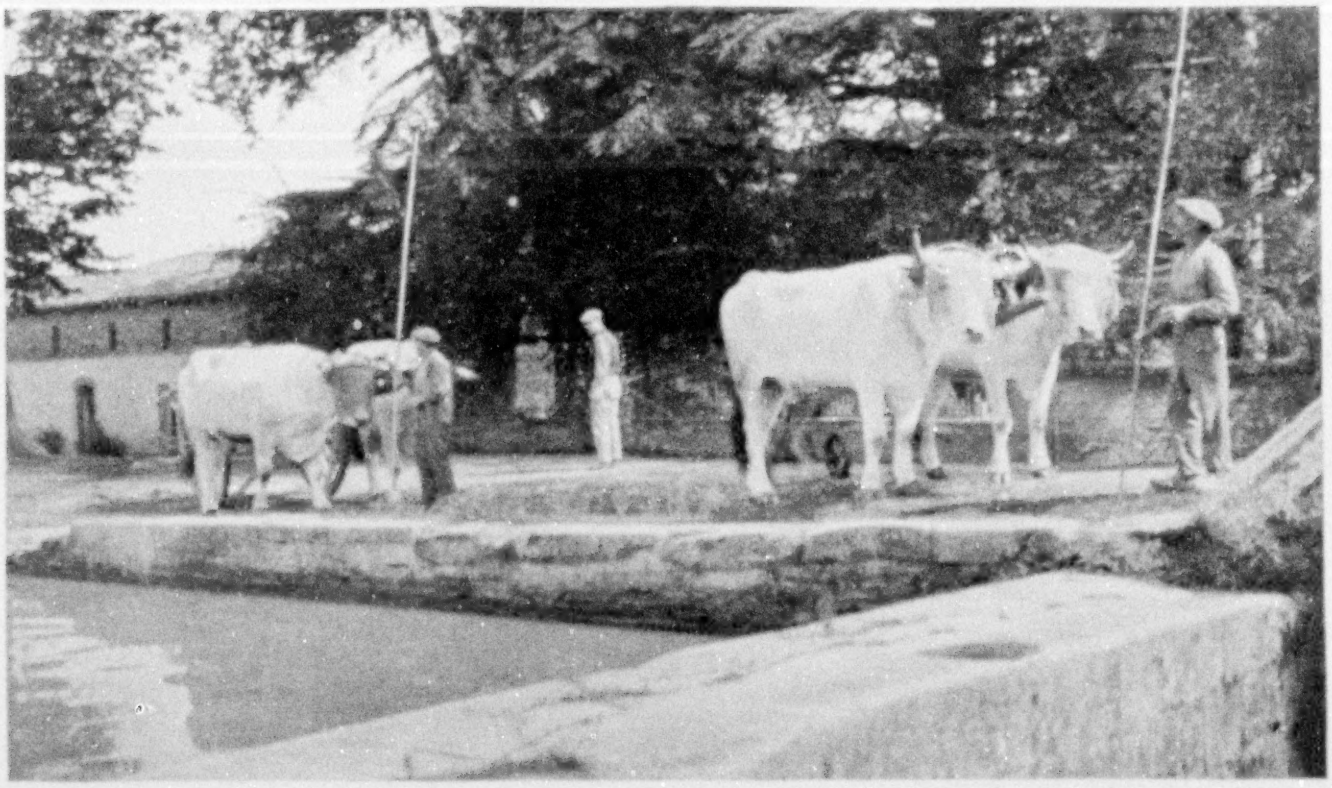
The Canal du Midi is not only an important commerce carrier; it is among the most beautiful of French waterways. Immediately beyond Toulouse we found ourselves floating through a series of woodland vistas, a ceaseless interplay of lights, shadows, and reflections, that

SHOWING THE PERMIT TO PASS THE LOCKS

The indispensable *permis de circulation*, giving the name of the craft, the number of inches of water it drew, and also those "of air," enabled the canoeists to pass 104 locks during their trip through the canals of France's sunburned southland.

A MIDI SCENE FOR THE BRUSH OF A BONHEUR

France has produced several breeds of excellent cattle, famed for milk-production and beef qualities. Whether at work in field or road, their presence often lends an added charm to a rural landscape. This owner wears the *béret*, a type of headgear which has recently come into vogue in England's smart circles.



"MILD-EYED DIGNITY WORTHY OF GREEK GARLANDS"

Life in the back-doors country of the Midi begins at 5 o'clock, when snow-white oxen drink at the canal side. At sweltering noon work ceases for a while, and the cattle, after drinking again, stand flank-deep in the backwaters. Oxen do most of the work in Midi fields, but horses and donkeys are used as draft animals in the towns.

changed with each turn of this endlessly twisting stream. It is small wonder that these same vistas once intrigued Henry James into the cautious remark that a taste in canals was "justifiable."

The Midi Canal's picturesque character is due to the magnificent trees which line its banks for more than 100 miles. Here are venerable oak glades, there alleys of plane trees, and yonder spear-straight pines or somber walls of cypress. Often, indeed, ranks of these different species parallel each other in a multiplied depth of sylvan shelter (see page 143).

Shelter—exactly! For, while Henry James approved of the Midi Canal's "sketchability," the fact is that its lovely curves and green wealth of foliage are alike due to its planners' method of mitigating, for the benefit of barge traffic, the sweeping winds of the region.

But I will go James one better. Nothing less than the epithet "fishability" could convey a picture of the Midi's anglers, squatting in endless succession along the canal bank. Our approach scarcely stirred them from their piscine dreams.

But not so with the bicyclist workmen, three in close single file, pedaling homeward along the towpath in the peaceful eventide. The leader spied our craft; they all spied it. He stared and craned; they all stared and craned. Then rashly he faced backward; they all rashly faced backward, for a last, astonished stare. Suddenly, like a feat in follow-your-leader, they all went over into the canal, and the evening calm was rent by enraged outbursts in the langue d'oc, a tongue seemingly rich in expletives and recriminations.

By eight o'clock, our dinner over and blankets stretched, we were falling asleep amid a woodland silence so profound that one could almost imagine he heard the grass growing.

At sunrise we perceived that a big barge, with a boxlike construction swinging at its stern, had anchored near us. Just as we were discussing the barge's motive power—it had no engine—the skipper led a horse out of the stern annex, which proved to be a floating box stall, hitched him to the towrope, and the day's work began (see illustration, page 146).

A MIDI BARGEE PROPHESIES A TEMPEST FROM CLOUDLESS SKIES

Repeatedly we passed him and his craft, that day of burningly blue skies, as we

BARGAINING FOR FOIE GRAS ON THE "HOOF" AT CASTELNAUDARY

One of the town's leafy squares is reserved on market day for poultry and game. The peasants ride in on bicycles, with their geese sitting sedately arow in trays attached to the handlebars (see text, page 154). Flocks of these birds patrol the canal sides, their large numbers indicating a regional industry.

paddled over canal stretches so beautifully wooded as to suggest a stream in some ancestral park. Toward dusk he overtook us at Montgiscard.

"You'd better sleep ashore," he called to us. "There'll be a storm to-night."

We agreed that, with the prevalent "settled dry" weather, the old fellow's prophecy was absurd. Nevertheless, we had hardly fallen asleep in the canoe when we were roused by a true Midi storm. It was a terrific offensive of the elements, and ceased with an extraordinary abruptness, whereby one half of the heavens was already starry while the other half was still shot with lightning.

That we emerged, safe and dry, from a storm which smashed branches, burned out fuses, and damaged small craft was a matter for congratulation. But by what signs had that old bargee foreseen a tempest springing out of cloudless weather?

We afterward found that he was a well-known character. Farmers would ask him in to dinner and barge skippers would stand him drinks for an expression of this weather prophet's views. "If Captain Pierre of the *Amélie* says it's going to rain," so ran the women's proverb, "you'd better take your linen in off the hedge." His peculiar method of weather forecasting was a mystery that we were to fathom later on (see text, page 166).

NAMES REDOLENT OF HISTORY AND ROMANCE DOT THE MIDI

By now we had left Gascony behind and were well into Languedoc. Gascony, Languedoc, Provence—names how redolent of history and romance!

For Gascony read Vasconia, and conjure up ghosts of the Basque-speaking Vascons who, in the sixth century, crossed the Pyrenees and gave their infusion of Spanish blood to the Midi. Earlier still, the region was part of the Roman Aquitania. The name recalls Eleanor of Aquitaine who, at her marriage to Henry of Anjou, later Henry II, dowered the English crown with a goodly portion of southern France.

Languedoc brings to mind that early

Photograph by Maynard Owen Williams

CARCASSONNE REALIZES THE MAGIC OF ITS NAME

This most picturesque and most nearly perfect example of a medieval fortress has stood for 15 centuries, until its lineaments have mellowed into a rich etching, an exquisite work of art. Even to-day the Cité is veritably a "City." This view is from the east.

TOWARD THE END OF THE MORNING MARKET

The eighteenth-century marble fountain of Neptune stands in the Place Carnot, the center of Carcassonne's somewhat squalid lower town, which is overlooked by the Cité (see page 150).

THE ROYAL GATEWAY TO CENTURIES OF THE PAST

The Narbonne Gate, the largest of the openings in the mile of outer wall, was the state entrance, under which passed lines of men in armor, cavalcades of knights, and processions of royalty.

Photographs by Maynard Owen Williams

"THE EPITOME OF HIGH-PERCHED, DRAWBRIDGE-GUARDED MEDIEVALISM"

Carcassonne's Old Bridge, from which this view is taken, is a thirteenth-century structure of eight arches. It spans the Aude River, which divides the *Ville Basse*, or lower town, from the medieval Cité.

culture, including rhetoric schools, splendid amphitheaters, and fine temples, upon which successive hordes of barbarians—Vandals, Suevi, and Visigoths—imposed temporary kingdoms, incidentally contributing their respective blood strains to the Midi.

Provence is "short" for Provincia Romana, as the Romans named their earliest conquest in Gaul. Yet, far from being what we moderns mean by provincial, this little corner of a country developed, through its eleventh-century *joglars*, or professional entertainers in jugglery and in poetry of the local vernacular, an entire "Provençal" literature which imbued southern France, northern Italy, and Spain.

From many remote blood strains and from constant transpyrenean infiltrations has sprung the Midi type—dark-skinned, glowing-eyed, often Saracenlike.

As for the langue d'oc, we could comprehend nothing of this rather harsh-sounding Romanic dialect. Fortunately, the Midi's natives are bilingual and could advise us in French as to suitable stopping points in the "wilderness," as they called their countryside's less-inhabited stretches.

Night anchorage in the wilderness was simplified by the fact that the Midi Canal has but one towpath—a curious unscrambling occurs whenever two barge teams meet—and that this arrangement left the opposite bank free from the danger of passing traffic. There we would pitch camp under the shadow of some huge antique milestone whose face was scored with the intertwined initials of bygone lovers.

CANOEING "UPHILL" THROUGH A LOCK

Putting a canoe "uphill" through a lock is a tricky business until custom enables you to take your daily dozen or so without turning a hair. As you enter between the towering lock walls and the black gates close, you feel uncomfortably as if you were imprisoned in a concrete tomb. Then, with a tremendous leap, come the admitted waters, boiling around the frail canoe.

Now you feel rather like some child's

Photograph by Maynard Owen Williams

THE CHÂTEAU AND WESTERN DEFENSES OF THE CITÉ: CARCASSONNE

The ghostly pageant of long-maned barbarians, of Frankish battle-axes and Moorish banners, of mailed Crusaders, English yeomen, and French kings, has come and gone, leaving behind a fantastic, romantic jumble of ramparts, towers, bastions, battlements, and barbicans which bring home a sharp sense of the Cité's complete dissociation from the present. This view from the Round Tower of the Bishop shows details of feudal architecture.

bath toy, adrift in a mammoth bathtub, with both faucets full on. But gradually the turbulence subsides and you are buoyed up, up out of the shadows and out upon the surface of a sunlit stream.

Almost invariably as you gain the quay level you are confronted by the staring human beings and the indignantly barking dogs—an entire hamlet—who have rushed canalward to see the show.

Once, indeed, at a tiny village, upon a child's announcing our arrival by shrieking down the street, "There's a queer something in the lock!" several angling enthusiasts hurried on the scene with rods and scoop nets, hoping to land a leviathan. Here the cheery lock keeper took us in for dinner, and the haymakers catered to our photographing mania by producing everything posable, including the local pig.

In that neat, measured-out countryside the day's work began at gray 5 o'clock. Then the first barge locks through, old crones marshal regiments of geese, and snow-white oxen drink at the canal side. At sweltering noon the clatter of the American baling machine ceases, men put cabbage leaves in their hats, and the oxen stand flank-deep in the backwater. Such a mild-eyed dignity as theirs was worthy of Greek garlands and festal processions.

Field work and locking through continue until 8 o'clock. Then there is an hour of mandolin tinkling and beer drinking in the canal-side café whose placard begs "the amiable clientele to wish well

THE ARCHED BRIDGE OF ANTIQUITY FRAMES A CANAL VISTA

"Occasionally we would catch a glimpse of a composition, as painters say: canalward-dipping slopes cut by prim hedgerows; towering haystacks; a hill-topping, red-roofed farmhouse" (see text, page 161).

to regulate the consommations before departing." And so to bed. Such is life in the back-doors country.

A MARKET TOWN ON A MARKET DAY IS A BUSY SIGHT

Castelnaudary tempted us ashore for that busiest of sights, a market town on market day. One of its leafy squares was reserved for vegetable sellers, a second for poultry and game (see page 149), and a third for horse dealing. Down one street came cartfuls of huge hampers containing mixed families of ducks and rabbits. Down another came peasants bicycling into town, with geese sitting sedately arow in trays attached to the handlebars.

Trade was brisk, and by noon the world and his wife were walking homeward with squirming rabbits and cackling chickens under their arms. As for the horse fair that we witnessed in Rosa Bonheur's native countryside, it was just such an animated sight as her famous canvas portrays.

It was here that we added mosquito netting to our camping outfit. We had searched many shops without finding it, when at last we stumbled on a miniature department store. With a vague recollection of the French term for mosquito nets, we entered and asked the salesman for "two *mousquetaires*."

"Three?" he inquired politely.

"Two will do," we replied.

He continued to press us to buy three, this overzealous salesman. He declared that they always came in threes, and we marveled at this strange French custom. Finally we yielded to the inevitable. He went off and presently returned with something which he handed to us with his best bow.

It was a copy of that immortal tale which relates the adventures of Athos, Porthos, Aramis, and d'Artagnan! Feebly we fumbled the pages of our pocket dictionary. "Not 'Three Mousquetaires,'" we announced at last, "but two *moustiquaires!*"

He directed us elsewhere with a sympathetic courtesy such as might have disarmed that first of interlingual misunderstandings at the Tower of Babel.

Beyond Castelnaudary lay less amusing experiences. We had heard of the renowned mistral and were ambitious of encountering a wind with so poetic a name. Wind? Rather it was a screeching gale, out of an otherwise perfect summer's day, that brought us to a standstill. Towing by hand was the only possible means of progress, and thereby the *Nageoma* brushed against the rushy banks and acquired some uninvited passengers.

THIS LOCK KEEPER'S FAMILY FED HUNGRY AMERICANS

The open season was on and father had gone a-hunting; but he had already supplied the family larder with game birds, which were keenly relished by the canoeists after a many-weeks diet on tinned food (see, also, text, page 162).

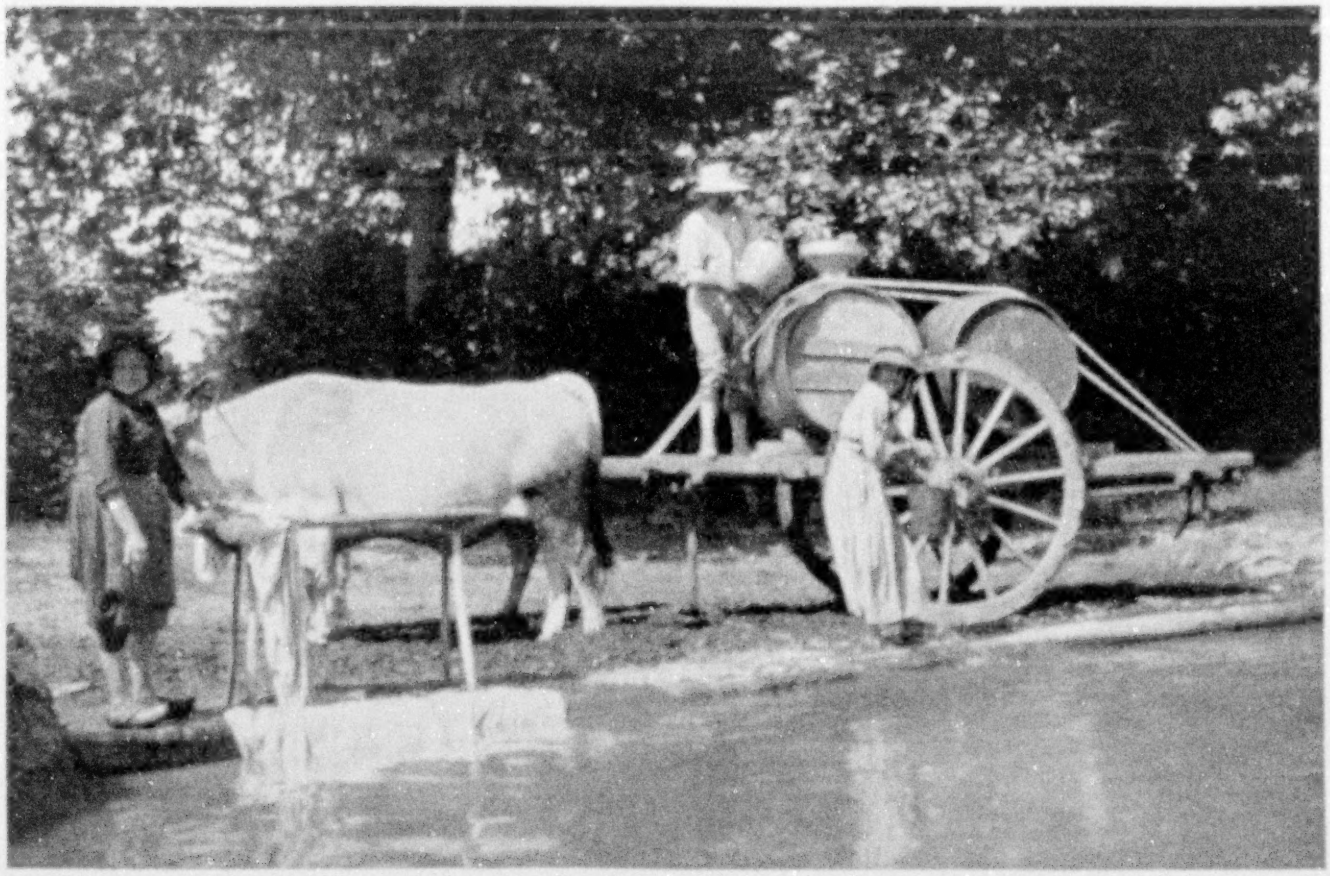
It was bad enough to discover frogs among our sleeping arrangements, but the climax was reached when, as we paddled toward Carcassonne, my companion announced with tragic calmness, "There's a snake in the canoe!"

SCOTCHING A SNAKE IN A CANOE

As boat rocking cannot be successfully practiced in a canoe, we simply paddled on to Carcassonne as if unaware that a 2-foot water snake was sunning himself on our blankets.

That scotching a snake in a canoe, even when you have tied up to a quay, may be more disastrous to the canoeists than to the creature, was proved in our case when a blow with an iron rod missed the reptile but put a hole through the bottom. The *Nageoma* began to fill, and we landed her and our effects only by rivaling the rapidest of rapid-action movies.

With our possessions sopping, our canoe useless, we sat disconsolately on the quay, faced by the improbability of negotiating repairs, if at all, in less than the Midi's favorite "eight days." But Carcassonne is a canal port and is frequented by barge mechanics, a fact of which the lock keeper presently informed us.



DRAWING CANAL WATER FOR THE VINES OF THE MIDI

Irrigation of the vineyards is common throughout the dry Midi. The sabot-shod woman at the left pauses from her laundry task to gaze curiously at the strange craft which has invaded this rural stretch of the canal.

A REAPING-HOOK OFFENSIVE IN FULL SWAY AGAINST THE VINEYARDS

From Carcassonne to Béziers the scene resembles a continuous vineyard 60 miles in length (see text, page 162). When the long-awaited, all-important grape harvest begins, the entire population of the villages takes to the fields for a month of unbroken working days, sometimes 17 hours long.

NEWLY CUT GRAPES ARE CONVEYED FROM THE VINEYARDS IN TUBS

In the Languedoc grape-growing region, villages of huts cluster about an old, partly decayed château, whose proprietor owns the vineyards. The peasants work for him either on shares or for daily wages, and the "châteaux wines" actually refer to specific châteaux vineyards.

STORED SUNSHINE OF THE MIDI IN LUSCIOUS CLUSTERS

As the canoeists pushed the *Nageoma* among the reeds, boys and girls came down from the vineyards to offer tempting bunches of fruit. Shopkeepers and even fishermen exchange their ordinary occupations for bucket and reaping hook when "the immortal vine" calls to harvest.

AN AQUEDUCT CARRIES THE MIDI CANAL TO BÉZIERS

"Here, Louis XIV, thou art truly great!" exclaimed Arthur Young, the British agriculturist, on viewing Béziers, with its port on a canal. The town stands on a bluff above the Orb River (see, also, page 160), and is the center of a wine trade. An aqueduct also carries the canal over the river at Agen (see text, page 134).

"Jean," he called to a black-smocked urchin, "run over to Michel's and tell him there's a boat in trouble, and to come at once."

Ten minutes later, when we returned from storing our baggage with the lock keeper, we beheld Michel and his gang rushing on the scene. Apparently they supposed some big barge was foundering, for they bristled with every kind of paraphernalia short of a diver's suit. When we caught up with them Michel, seated on the overturned *Nagcoma*, was scanning the horizon for wrecks.

"Strange!" he said. "Where *is* that boat?"

I replied, "You're sitting on it."

When those four husky barge repairers became aware of our canoe they burst into roars of laughter, and Michel said the *vin rouge* would be on him. Then, with a handful of white lead and two copper disks, they executed a most professional repair in 20 minutes.

When we told them rather proudly that we had met and conquered the famous mistral, Michel really annoyed us by saying, "Pooh, that's just a bit of a breeze that kicks up in these parts. The real mistral blows between Marseille and Nice."

CARCASSONNE EPITOMIZES MEDIEVALISM

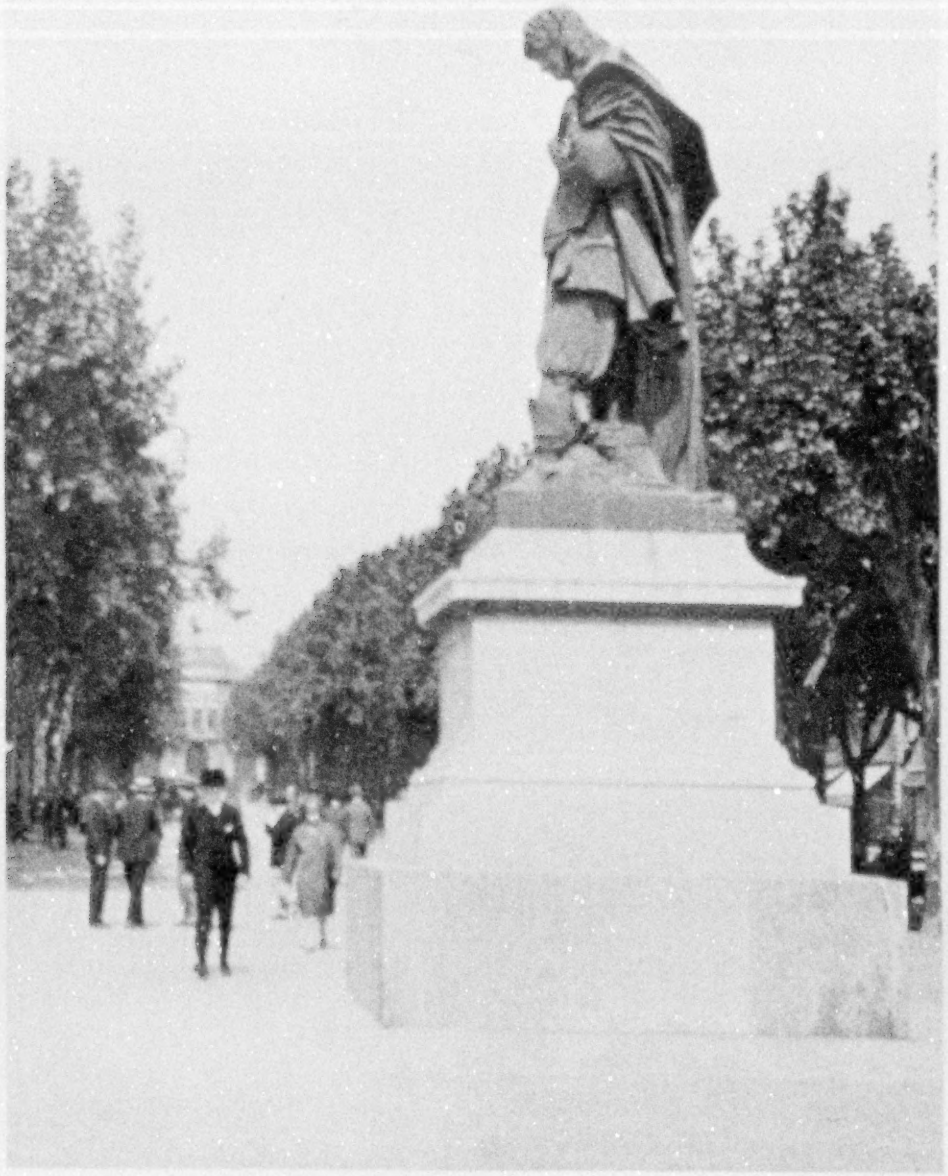
Not only did Carcassonne thus upset the "eight days" tradition; it eclipsed Toulouse by perfectly realizing for us the magic of its name (see page 150).

"A city on a hill cannot be hid." The

proverb brings home a sharp sense of the Cité's complete dissociation from Carcassonne's *Ville Basse,* or lower town. Yes, yonder it rose, the steep hill, its crest encircled with mighty walls, hardly less than a mile around, thronged with tall towers showing candle-snuffer tops — the epitome of high-perched, drawbridge-guarded Medievalism, profiled against fleecy clouds adrift in the blue (see page 152).

For 15 centuries it has stood thus, the Cité of Carcassonne.

At once it claims you in intimacy. Somehow you feel that you must have seen it before or, at least, must have dreamed of it in those golden days when you played at "castles," and storied knights wound their horns at drawbridges, and captive princesses in towers let down their hair.



BÉZIERS HONORS THE FATHER OF THE CANAL DU MIDI

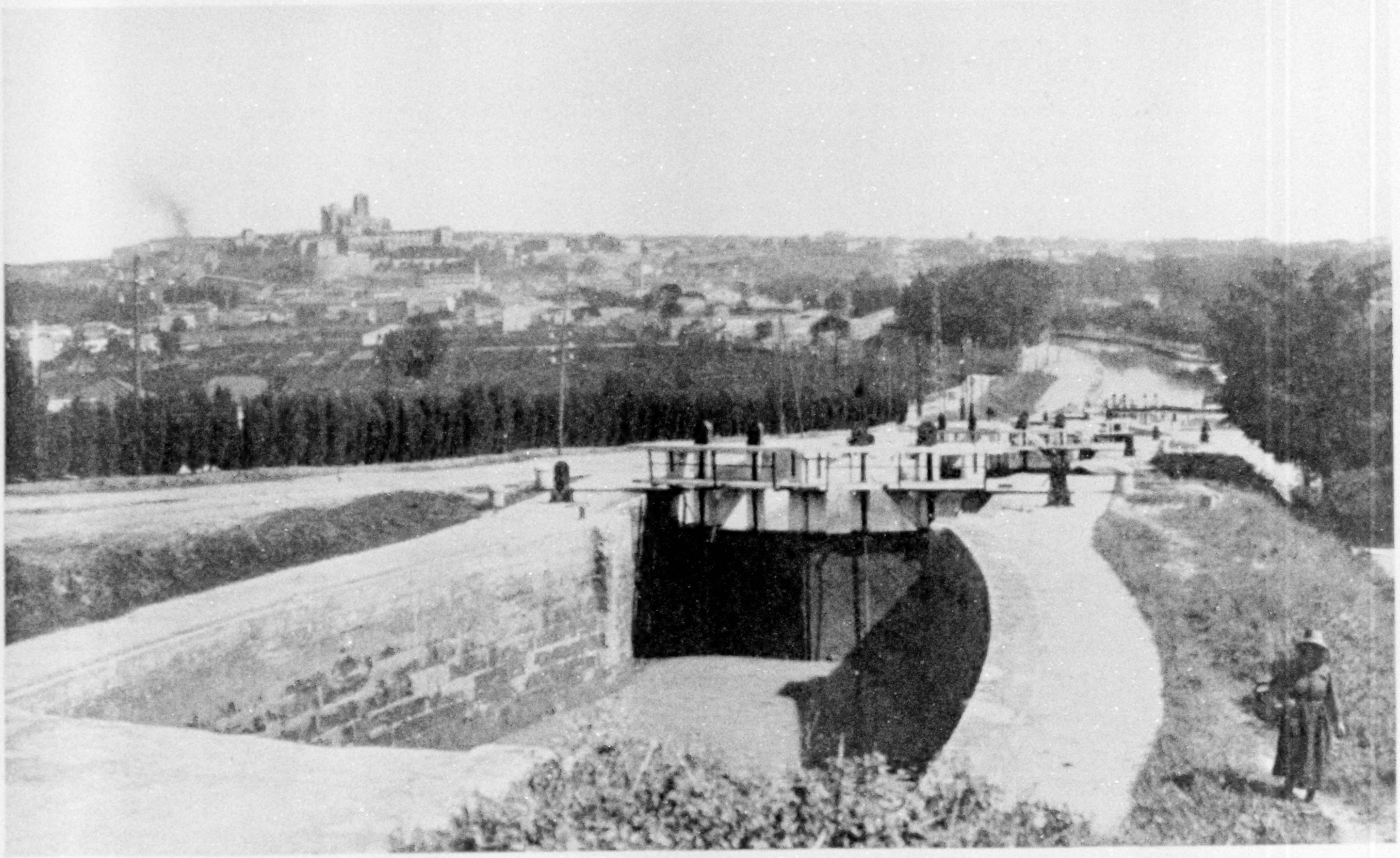
The 150-mile waterway which Pierre Paul Riquet, the town's most famous native son, built at his own expense connects Toulouse and the Mediterranean, and is still serving southern France after two and a half centuries of use (see text, page 164).

Beyond the fact that the Roman Empire gave self-government to Carcaso, as it was then called, and classed it as a "noble" or "elected" city, little of Carcassonne's history emerges until the fifth century. It was then that the Visigoths fortified this strategic point, which commands half-a-dozen Pyrenean passes, by erecting the Cité on the ruins of Roman ramparts, utilizing their knowledge of Roman fortifications.

For 1,500 years these fortifications have been accumulating the cobwebs of history. Here East met West and North met South, in the succession of foreign conquerors who came and went, now besieging the Cité and now modifying it into what was acclaimed by Viollet-le-Duc, its chief restorer, as the most picturesque and most nearly perfect example of a medieval fortress.

What with its two encircling walls, its numerous massive towers, and its minimum garrison of 4,000 men, the Cité was deemed so nearly impregnable that it remained unbesieged for centuries at a time.

We found it to be veritably a diminutive "City," with perhaps 1,000 people inhabiting the low-doored huts that line its crooked alleys or utilize Visigothic masonry by huddling against the vast walls. It was a curious experience to walk around the battlements, dodging in



SEVEN LOCKS IN TANDEM LEAD DOWNHILL TO THE MEDITERRANEAN AT BÉZIERS

"We made a spectacular descent into Béziers. Certainly none of the many bystanders had ever seen the big system of connecting locks thrown open to so small a craft as ours" (see text, page 164). The canal has a drop of about 80 feet in 330 yards.

and out of medieval towers, while beholding underfoot a squalid population at clothes washing or goat milking, before the doors of their rampart-buttressed hovels.

ROMANCE STILL CLINGS TO CARCASSONNE

Away stretched the Montagne Noire (Black Mountain), opalescent in the sunset, while from afar a cloudlike peak revealed the Pyrenees. And as the Cité's circle of towers faded from golden to gray, we seemed to glimpse against their background a ghostly pageant of long-maned barbarians, of Frankish battle-axes and Moorish banners, of mailed Crusaders, and English yeomen, and French kings—the Cité's successive conquerors—passing onward through the arching centuries.

All are gone, and the lineaments of this once bloodstained fortress have mellowed into a rich etching, an exquisite work of art.

We had glimpsed our fairy-tale city and must go. Reluctantly, as if losing romance for reality, we descended into the Ville Basse. There we passed a small boy, on crutches, playing in the gutter. I suppose that, living under the Cité's towers, he cherished a lame child's dream of climbing up there some day. At any rate he had, of all toys, a tin castle whose moat he was filling from the gutter. And then we knew that romance wasn't lost, and that, on the rich tapestry of his imagination, knights were winding horns at drawbridges and captive princesses in towers were letting down their hair.

Beyond Carcassonne lay the canal's loveliest stretch, with the Black Mountain's peaks rising higher and nearer, day by day, as we approached the foothills of the Pyrenees. Apparently barren, save for occasional vineyards, their outflung line, as seen at sunrise and sunset, glowed like some barbaric necklace of mother-of-pearl and gold.

GEESE PATROL CANAL BANKS

Occasionally, through the framing arch of an antique bridge, we would catch a glimpse of a composition, as painters say: canalward-dipping slopes, cut by prim hedgerows; towering haystacks; a hill-topping, red-roofed farmhouse; a flotilla of white geese patrolling the stream.

Sometimes the geese were ranked along the canal side, for a drink, with an old drill sergeant of a gander croaking behind them. "Company, 'tention! Fill bills—heads back—swallow!" Indeed, so omnipresent were they that we called them the canal patrol.

At the lock of St. Jean the canal stretched for perhaps a mile through a cypress alley whose towering walls rivaled the beauties of a formal garden.

St. Jean was memorable because of something that occurred as we issued from the lock and into the alley. Possibly because the cypresses shut out everything save a mauve mountain, rising beyond that mile-long vista, we fixed our eyes on the mountain, and, to the lulling stroke of the paddles, fell into revery. It was after some minutes of silence and beautiful thoughts that the bow paddle remarked dreamily, "I seem to have seen this place before."

I glanced about me. Not only was the scene hauntingly familiar, but there on the bank stood St. Jean's lock keeper. He was regarding us with a broad grin.

"Is it that your anchor is down?" he called.

Then we woke up. We were not ten yards beyond the lock, and for some moments we had been paddling a firmly moored canoe from which the anchor had fallen overboard.

FLOATING FOIE GRAS

That day when, at Homps, we had passed the seventh lock in one tedious mile, the lock keeper told us: "You'll encounter no more locks for 63 kilometers. The countryside is a veritable desert."

The "desert" lasted during two days' paddle through an unattractive region where, save for occasional gunfire in the woods, we sensed no trace of human beings. At the close of a hard day's work the bow paddle suddenly exclaimed:

"Heavens! We've nothing left but two tins of sardines!"

We dined out of one and throughout the next day cherished the other with heartfelt tenderness. It had gone the way of all sardine tins when, toward evening, we spied a red-tiled cottage on the bank.

CETTE'S FISHING FLEET HOMES IN FROM THE BLUE

Every year the fisher folk of this and neighboring ports hold a joust, or boat tournament. The vessels are divided into two fleets marked by different colors, those of Cette being red and white. The combatants, wooden lance and wooden buckler in hand, stand on ladders affixed to the stern and fight to the sound of warlike music. Those who upset three opponents may tilt for the prize.

Heartened, we paddled up to it and asked the goodwife if she could give us something to eat (see page 155).

"Not much," came her crushing response.

"Perhaps," we ventured unenthusiastically, for we had been subsisting on canned goods for several weeks, "you have at least some morsel of conserved food, preferably American?"

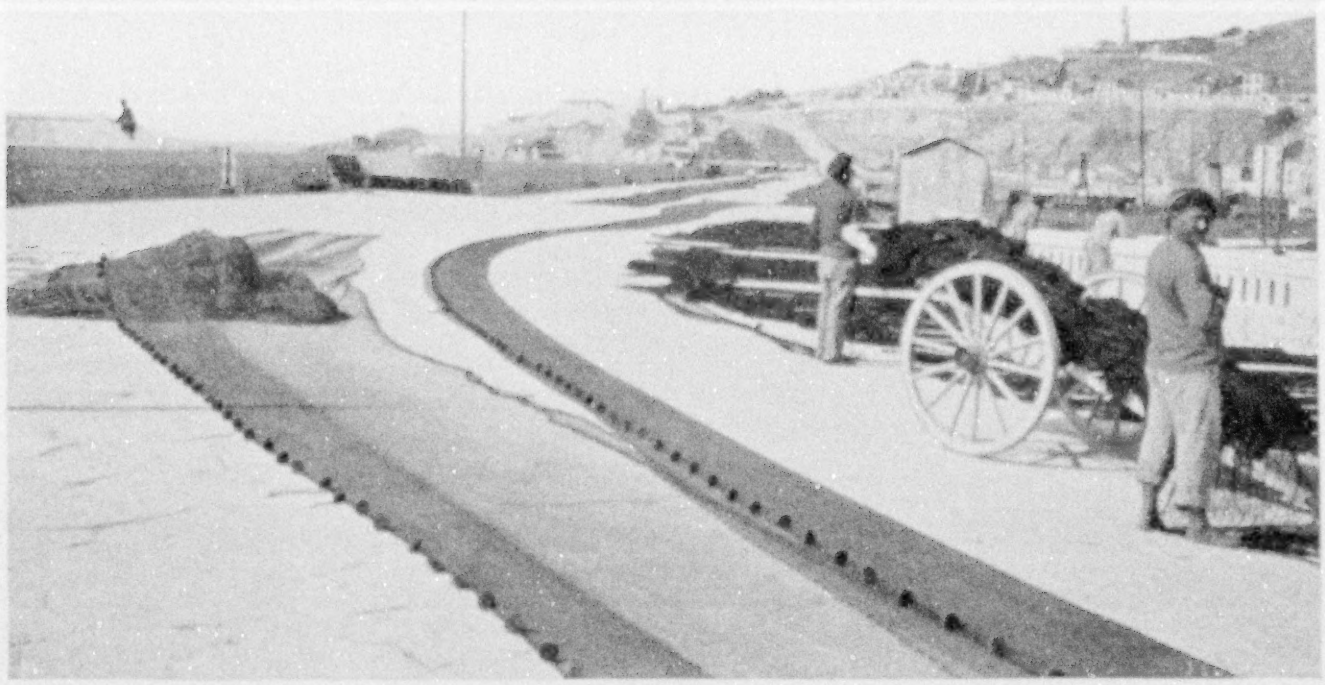
"No," she droned, "there's just some foie gras, and wine, and quail." Then, mistaking our thunderstruck stares for disapproval, she added, "Or, if you prefer, a partridge."

Incredible as it sounded, this wasn't mere rustic persiflage. The viands quickly appeared, to disappear even more quickly. And we, in our desert, appreciated how the Israelites felt in their wanderings when quail appeared upon the scene.

Half of the gastronomical mystery was explained when the goodman came in from the woods with gun and game birds over his shoulder. The other half was solved when we realized that the canal's omnipresent geese represented a regional industry—that they were, so to speak, floating foie gras.

From Carcassonne to Béziers the scene resembled one continuous vineyard 60 miles long. For us, thus far, it had remained unpeopled. But promptly at 5 a. m., on September 15, we were awakened by the laughter of peasants bearing reaping hooks and buckets, as they filed along the towpath.

Ahead marched monsieur the proprietor, leading a village's entire population into the fields. And they laughed and joked, these youths and maidens, these old folks and their little grandchildren,

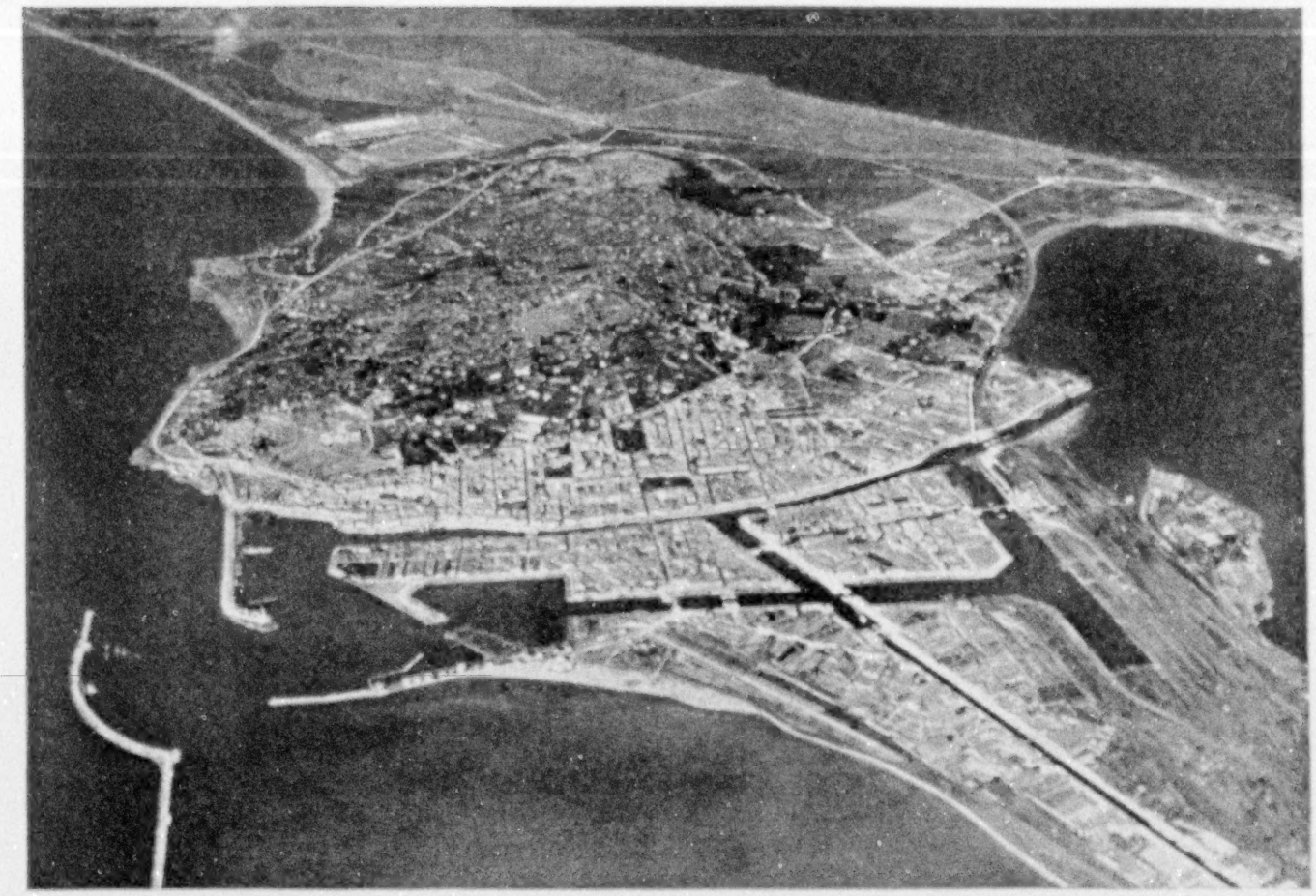


REGATHERING YARDS OF DRIED NET ON THE QUAY AT CETTE

The spread-out nets usually exceed 100 yards in length, and when dry each is gathered quickly and neatly into a handcart by two men.

UNLOADING THE DAY'S CATCH AT CETTE

Hundreds of small craft go out after sardine, tunny, and cod. The city's public institutions include a tribunal of maritime commerce and a council of arbitration in fishing affairs.



Photograph by Flandrin

CETTE LIES BETWEEN LAGOON AND SEA

The most important French seaport on the Mediterranean, after Marseille, is curiously situated beneath Mount St. Clair, the Mons Setius of antiquity, which rises up between the Etang de Thau, a salt lagoon, and the Inland Sea.

because *la vendange*, the long-awaited, all-important grape harvest, had begun.

A REAPING-HOOK OFFENSIVE AGAINST THE VINEYARDS

From now onward hayfields, cattle, and even the "canal patrol" vanished from a scene which, for a month of unbroken working days, sometimes 17 hours long, was exclusively one of grape gathering. Shopkeepers and even fishermen dropped their occupations for the harvest, and our line of supplies became threatened by this big reaping-hook offensive.

"My wife would gladly cook you a meal," one man told us, "but she won't return from the fields until 10 o'clock tonight." And yet another thus met our supplication for some vegetables: "Oh, there's nothing of that sort around here. One can't afford to raise anything but grapes, to the last square meter."

The truth of that statement was daily more evident as we approached Béziers. If the Midi's grape harvest for 1926 shows a decrease, it isn't for lack of intensive cultivation. It may be partly due to the jealousy of vine parasites directed against the workers. That, at least, is one explanation of the curious term, *la jalouse*, which we heard peasants applying to the phylloxera.

We made a spectacular descent into Béziers. None of the many bystanders had ever seen the big system of connecting locks, with a drop of some 80 feet, thrown open to so small a craft as ours (p. 160).

Béziers and Cette constitute the eastern Midi's wine-trade centers, just as Bordeaux performs this function in the west.

We paused at Béziers long enough to do homage to the statue of Pierre Paul Riquet, the father of the Canal du Midi. That 150-mile waterway, running between Toulouse and the Mediterranean, and still serving southern France after two-and-a-half centuries, was built by Riquet, entirely at his own expense, at a cost variously estimated at from 17,000,000 to 34,000,000 francs. Antedated in France by but one unimportant canal, the Midi cut represented a big undertaking and a fine act of public service.

Riquet was forgotten; for long his

Photograph by Maynard Owen Williams

THE SEESAW WAGON IS ABOUT TO TIP THE WINE CASKS

Cette's wine establishments give employment to thousands, for a third of the Hérault Department's surface is planted with vines, giving it first rank in vineyard area.

WHEN CETTE'S FISH MARKET GETS UNDER WAY

Fifteen minutes after the fleet is moored, the wives have osier trays full of fish spread out in the quayside market place. The felt slipper is worn by many elderly peasant women of France.

A FARSIGHTED FRENCHMAN BUILT CETTE'S FISHING HARBOR

The port's prosperity dates from 1666, when Riquet (see text, page 167) constructed the Old Basin as a terminus for the Canal du Midi, and thus put Cette on the commercial map.

burial place remained unknown. Then a tardily appreciative posterity reinterred his remains in Toulouse Cathedral and erected memorials at two towns on the splendid waterway which this farsighted Frenchman had dreamed of and achieved.

Vineyards continued unbrokenly until we reached Agde. Nine kilometers ahead, so the lock keeper warned us, lay a salt lagoon 11 miles long. "And you'd better not try it in that little craft," he added. "The Étang de Thau can kick up like the Mediterranean."

It was a glorious, summerlike day, however, so on we went. Presently we breasted an anchored canal boat. It was none other than the *Amélie*, with old, weatherwise Captain Pierre aboard (see text, page 149).

"You'd better hitch on and come aboard for the night," he called, with a squint up at a perfectly cloudless sky. "There's bad weather in sight."

This time we harkened to the voice of prognostication and accepted the skipper's hospitality. It was fortunate that we did. With late afternoon came so violent a storm that the *Amélie* remained moored overnight, and even the big steam barges delayed crossing the Étang de Thau.

Next day, as the *Amélie*, under steam tow, issued on the lagoon near a system of big salt-water evaporators, we begged Captain Pierre to reveal his method of weather forecasting. We said he owed it to science, and reinforced our arguments with tributes of beer and cigarettes.

At last the old fellow came out of his reserve. He said:

"Do you see my dog over there, with the stick-up ears? Once his left ear was badly chewed in a fight. Well, it's a funny thing, monsieur, but ever since then that ear always droops whenever it's going to storm!"

Beyond the Étang we slipped tow and paddled down the canal which connects lagoon and sea. Now appeared Cette's towering background, the hill of St. Clair, flashing jewellike in the sun. Then the land narrowed to a strip, and sand dunes lifted along its verge. We jumped out of the canoe and took the shortest cut to their crests.

CETTE RESERVES A QUAY FOR ITS FISHING FLEET

Suddenly the gray canal, our companion for a month, was forgotten, as we sighted that long-awaited seascape of Mediterranean blue!

We paddled onward into Cette over a canal whose hotel-fringed quays and busy ship basins lent a Venetian air to the scene. Again we felt the hand of Riquet, for it was he who constructed this harbor as a canal terminus, and thus, commercially speaking, put Cette on the map.

CETTE'S FISHING FLEET HOMES IN FROM THE BLUE

We arrived just in time to view Cette's most picturesque spectacle, the return of the fishing fleet. In the boats came, two outflung files of bellying, lateen-rigged sails, like white-winged sea birds homing out of the blue. As they neared port, the respective skippers and their shore partners, watching from the breakwater, opened a kind of wigwagging communication which transmitted questions and answers as to the catch (see page 162).

Within a suprisingly few moments the fleet was moored and the women were laying out osier trayfuls of splendid fish in the quayside market place. Their blue-jeaned, felt-slippered men were discussing fisherman's luck, over bread, cheese and wine, in near-by cafés.

We strolled back to the breakwater and watched the sun's blazing disk sink behind St. Clair's shoulder, as so often we had seen it sink over the Midi—now for our last time.

The Midi! It is France's sunburned southland whose fires coursed in the veins of Bernard de Panassac, highwayman and troubadour; of dare-devil d'Artagnan; of Cyrano de Bergerac, duelist-poet supreme; of dashing Richard Plantagenet, the most meridional of England's kings. It is France's music-loving, bullfighting southland, heady as its own wines, whose ragged revolutionaries marching into Paris first popularized the "Marseillaise."

Quick loves, quick hates, quick laughter—of such is the Midi, the Land of the Midday Sun.

IN SMILING ALSACE, WHERE FRANCE HAS RESUMED SWAY

THAT fertile plain known as Alsace, which is somewhat larger than the State of Delaware, lies between the storied Rhine and the rugged, forested slopes of the Vosges.

Nature has dealt generously with Alsace. Her level fields and rolling foothills are well suited to agricultural exploitation, and although there has been marked industrial development in certain sections, the richness of the soil is still the chief resource of the country.

Individual holdings are usually small and intensive cultivation is the rule.

Alsatian farm products include cereals, forage, and root crops, but few assume large commercial importance. However, hops for beer, cabbage for sauerkraut, and tobacco are raised for export. Cherries, prunes, apples, and pears are grown extensively, but wine grapes constitute by far the most important fruit crop. The vineyards cover the foothills of the Vosges, where there is more sunshine and less frost than in any other part of the province.

GREECE GAVE THE VINE TO ALSACE

The vine was introduced to Alsace by the Greeks through Marseille, before the Christian Era. Its culture flourished under the efficient rule of Rome and continued to prosper under the Frankish kings. Many of the present wine centers of the province can trace their existence as such back to the seventh and eighth centuries.

Most of the vineyards are small, but so assiduously are they cultivated that on a plot of little more than half an acre three or four thousand vines may yield nearly 150 gallons of wine. For the grape harvest, in the fall, peasants gather from all over the countryside. They labor from dawn to dark, singing at their tasks, and when the day is done they dance far into the night.

The tobacco industry, at one time almost abandoned, has flourished anew since the World War, under strict government supervision, the area cultivated being accurately designated and registered.

Linen, cotton, wool, and silk mills are numerous in the province, the manufacture of silk ribbons being an especially important industry.

Alsace has the distinction of possessing petroleum, a scarce commodity in Western Europe. There are also asphalt deposits in the vicinity of Cleebourg.

VILLAGE SAINT'S DAY CELEBRATION IS A COMMUNITY BIRTHDAY PARTY

While the traditional costumes of the province are no longer much in evidence save on special occasions, many of the ancient customs of the people still prevail. One of these is the celebration in each village of its Patron Saint's Day. This is a sort of large-scale community birthday party, when the town takes on a carnival air and tumblers and jugglers perform acrobatic stunts and sleight-of-hand tricks, while itinerant merchants sell patent medicines, cheap jewelry, and miscellaneous knickknacks.

For this festival the young people of each village elect one of their number to serve as a master of ceremonies. He organizes the entertainment, selects the location of the dancing platform, and is the official escort of the prettiest girl of the village. The day is spent in games and dancing, followed by a banquet at the inn.

Cleanliness is a universal virtue among Alsatian families. The peasant proprietor takes a great pride in the ownership of his home and usually has his name or initials, along with the date of construction, displayed on some part of his house.

Parental discipline is strict. If Young Alsace seems inclined to rebel he is reminded of the terrible Hans Trapp, fearsome creature who is purported to be capable of dreadful things.

This legendary figure finds its origin in an historic character, Jean de Dratt, a robber baron who struck such terror to the hearts of the people that after his death they made a bogy of him.

The Alsatian is a product of more than 2,000 years of recorded history. Because he is a persistent individualist, he has not only steadfastly resisted the efforts of successive conquerors to mold him to their form, but has striven constantly and with success to organize and develop an economic and social life distinctly his own.

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TRADITION DECREES THE COSTUME OF THE MAYOR OF CLEEBOURG

For many years the chief magistrates of this prosperous Alsatian village (formerly spelled Kleeburg) have dressed in the same way and the present officeholder is bound by tradition not to change the style. His tricolored sash with gold tassels is the symbol of his office and this alone has changed, from Germany's red, white and black, before the World War, to the red, white and blue of France.

PEASANT DEVOTION FINDS EXPRESSION IN MANY A RUSTIC CALVARY

The fields and byways of Alsace are plentifully dotted with crosses and shrines to the Virgin or to some patron saint, and the peasants always do them reverence in passing. This one is on the Barr Plain, a region famous for its hops.

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READY FOR CHURCH

The bows of heavy ribbon which Alsatian girls wear on their heads indicate their religious affiliation. Protestants wear black while Catholic women wear bright colors, especially red and plaids.

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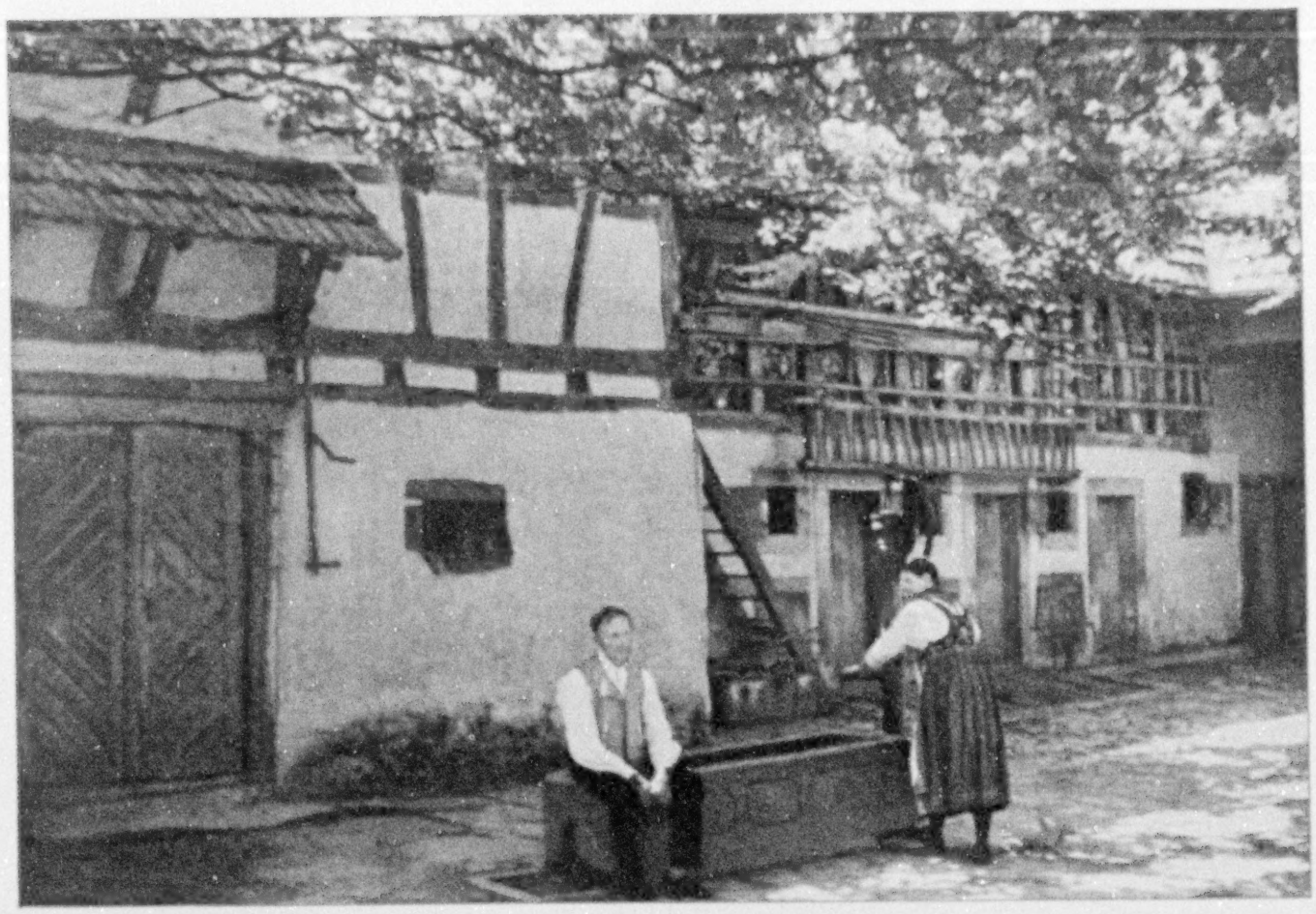
HALOS FOR HOLIDAYS

Unfortunately, in Alsace, as in most other parts of Europe, the picturesque costumes of the past are fast disappearing from everyday life. They are worn now only on very special occasions.



GARLANDS OF GRAPEVINES ADORN THE HOMES OF RICH AND POOR ALIKE

There is a provincial proverb that "no man who has not had a full draught can be an honest man."

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WHERE GOURMETS COME TO WINE AND DINE

Few places provide greater attractions for the epicurean than the village inns of Alsace. *Pâté de foie gras* claims the vicinity of Strasbourg as its original home, while so famous are the wines of the province that the Grand Monarch is said to have annexed it (1679-81) chiefly because he wanted its vineyards. The advent of the automobile has converted many of these inns into filling stations of a dual nature.

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A SWARM OF BLACK BUTTERFLIES

Such finery as this is handed down from one generation to another. The butterfly head-bows or caps are of very heavy taffeta ribbon (see also Color Plate II), the shirtwaist of sheerest linen with lace cuffs, the bodice of velvet and the wide skirt of very stiff silk, much gathered at the waist. Shawls and aprons are of a lighter silk and reflect the taste and industry of their wearers in the hand-embroidery that adorns them.

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A TOWN PUMP FOR GROWN-UPS ONLY

Water is scarce in many Alsatian villages, so the handle is purposely placed high in order to be out of reach of the children.

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BOWS AND BELLES OF BLAESHEIM

The patent-leather pumps worn by these young ladies would indicate that Alsatians are not entirely resisting the influence of the fashion world.

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THE ALSATIAN LANDSCAPE UNFOLDS A PANORAMA OF PROSPEROUS CONTENTMENT

Despite the wars that have ravaged them and the armies that have foraged here, the fields of Alsace produce bountiful crops of cereals and fruits. The patchwork appearance of these fields is the result of a practice, common in many parts of Europe, of dividing the land of a father equally among his children. There are no fences between these plots but stone markers are placed at the corners, and they are sometimes bordered by rows of red poppies. Periodically the village authorities remeasure them to be sure that no one is encroaching too seriously on his neighbor's land.

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THE IRON-BOUND BUCKET STILL SERVES IN GEISPOLSHEIM

Formerly only the wealthier villagers could afford a well, and their less prosperous neighbors all used it. This worked satisfactorily until drought caused a water shortage and then close guard was kept over the well to prevent poaching and wastage. Sometimes a short-tempered dog was tethered where he could perform sentry duty. This village of Geispolsheim is the "sauerkraut capital" of Alsace.

NAVIGATING THE "NORGE" FROM ROME TO THE NORTH POLE AND BEYOND

The Designer and Pilot of the First Dirigible to Fly Over the Top of the World Describes a Thrilling Voyage of More Than 8,000 Miles

By General Umberto Nobile

Of the Italian Air Force

IT WAS in May, 1925, while the world was still anxiously awaiting news of the Amundsen-Ellsworth Airplane Expedition, which had come to grief on the Polar ice, that I began to consider the problem of using other aërial means for polar explorations.

Heavier-than-air apparatus did not appeal to me. Polar ice is too uneven and, during the good season, too often hidden by fog to permit landing with any considerable degree of safety. Moreover, even if a successful landing is managed, the resumption of flight is problematical, owing to the continuous movements in the formation of ice, caused by winds and tides.

On the other hand, with a dirigible, there is the possibility of slowing down and even coming to a full stop in the air without being compelled to land, whether for the purpose of taking observations or repairing damages. As to the discharge of men and materials, the landing maneuver presents some difficulties, but it is free from excessive danger when the necessary preparations have been made, and provided, of course, that atmospheric conditions are not utterly unfavorable.

For these reasons I conceived the idea of preparing and effecting an Italian Polar expedition with a dirigible, and by June, 1925, my plan had already taken shape in its main lines. We would start from Spitsbergen in order to explore all that Polar zone within a radius of 600 to 900 land miles. I did not contemplate a mere run to the Pole, but a campaign of exploration, taking advantage of favorable weather conditions prevailing from May to September. We would, in this manner, have effected a fanlike series of explorations from our island base.

While this Italian project was ripening, Captain Roald Amundsen asked to meet me. In our interview he explained his idea to use a dirigible to cross the Arctic from Spitsbergen to Alaska. His idea was conceived independently of mine, but after mine.

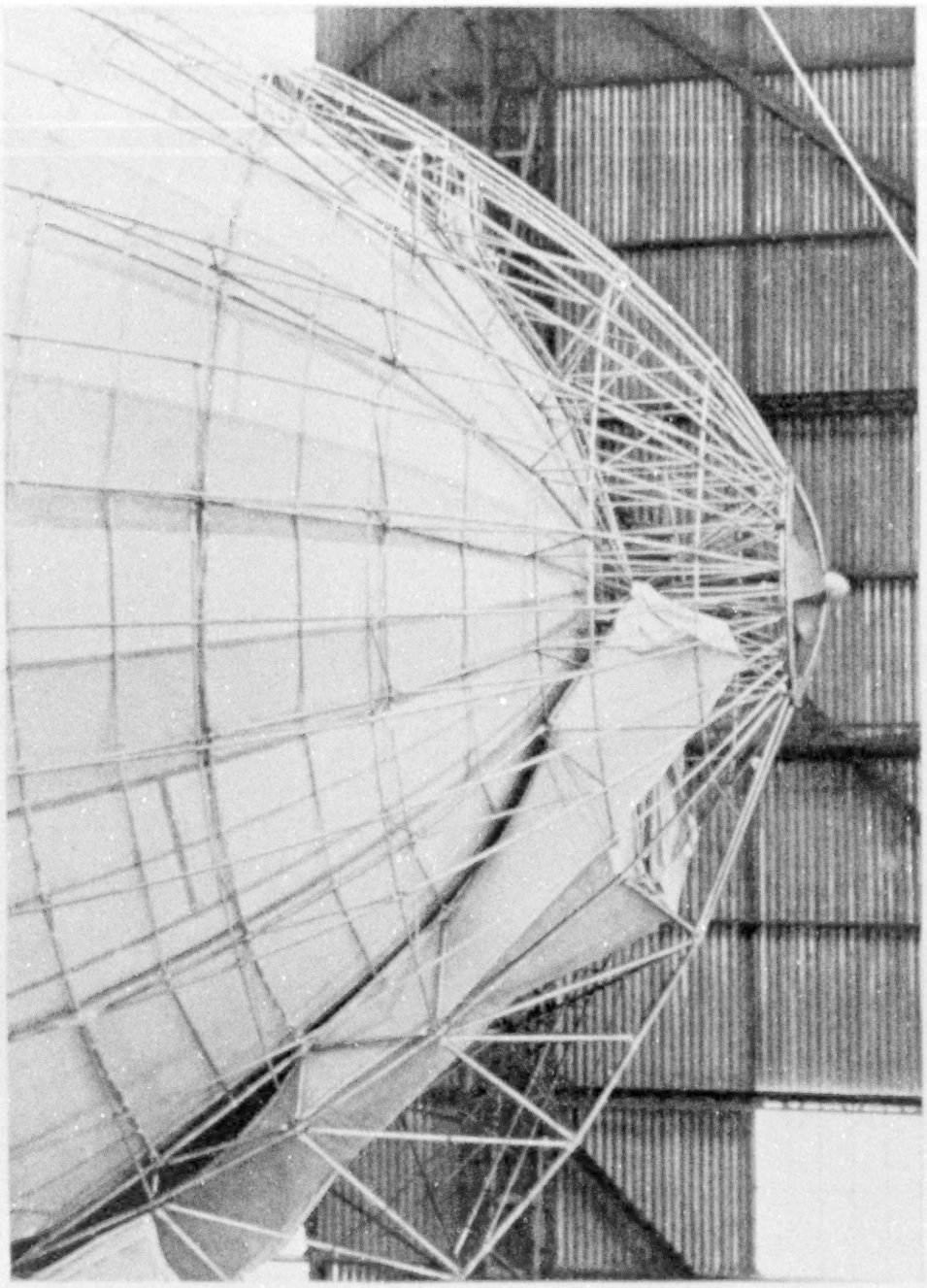
We soon came to an accord, under the terms of which I assumed the whole responsibility for the technical preparation for the expedition. This was effected in Italy under my direction and responsibility.

HOW THE AIRSHIP WAS CONSTRUCTED

The airship chosen for the expedition was the *N-1*, belonging to the Italian aërial fleet and built two years previously. Her first trial flight took place in March, 1924.

Here it is not necessary to give a detailed description of what we call the Italian semirigid type of airship. It is enough to recall that the body of the ship, having a shape for good penetration, is built of a rubberized triple-ply fabric. This body, filled with hydrogen, which gives the necessary lifting force, is divided into a number of compartments by means of transverse diaphragms. The inferior part of the hull of the ship is stiffened by a metallic framework of a triangular section consisting of a number of beams connected by means of knuckle joints. Each beam is made of tubing steel.

This framework is covered with varnished fabric. The room inside of it contains the gasoline tanks (32 in number) and their pipes and also the cables for controlling rudders, elevators, gas valves, air valves, and engines.



Photograph from General Umberto Nobile

PLASTIC SURGERY FOR A DIRIGIBLE

In order to make it possible to secure the *Norge* to a mooring mast, it was necessary to provide her with a stiffened or rebuilt nose. This was effected by building on to the original *N-1* of the Italian aërial fleet a framework of tubing steel shaped somewhat like a cupola. This was then covered with a rubberized fabric (see illustration on opposite page).

The nose of the airship is stiffened by means of a metallic frame in the shape of a cupola, which is also made of tubing steel. This cupola is connected with the framework.

The surfaces as well as the rudders and the elevators are placed on the tail of the ship in such a way as to form a cross. They are connected by means of ropes and steel rings which run along the parallels of the hull, and are themselves connected by means of other tubing steel lying along the meridians.

The commander, his associate officers, the ruddermen, the radioman, and the meteorologist have their places inside the cabin. The metallic frame of this is also made of tubing steel and is connected with the framework of the hull and directly communicating with the inside of it.

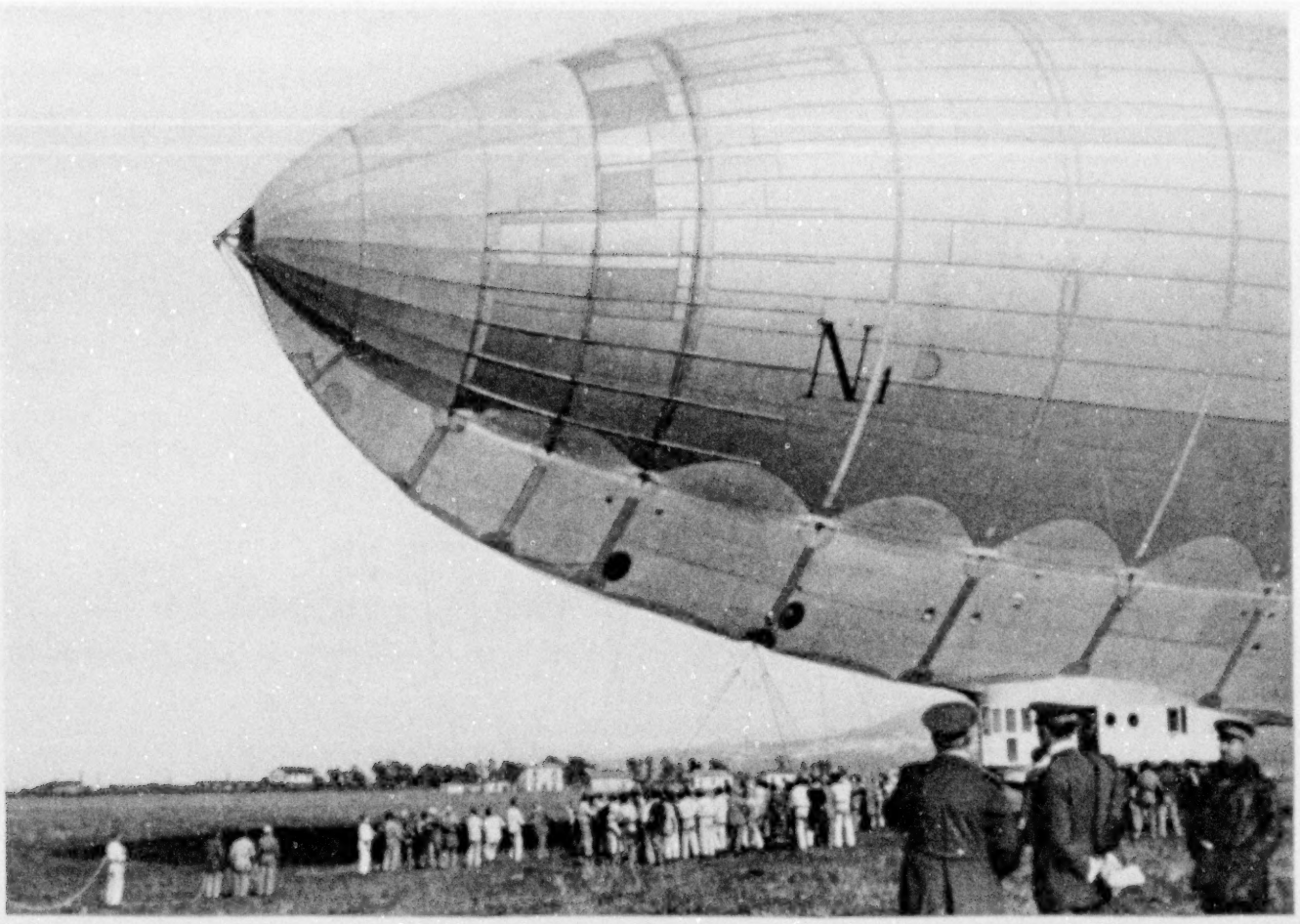
In the forward part of the cabin are installed the devices for controlling the rudders, the elevators, the valves, and the engines.

The engines are three in number, each of 250 horsepower. Two are located about the middle of the hull of the ship, not far from the pilot cabin, one on each side; the third is located in the center, not far from the tail of the ship.

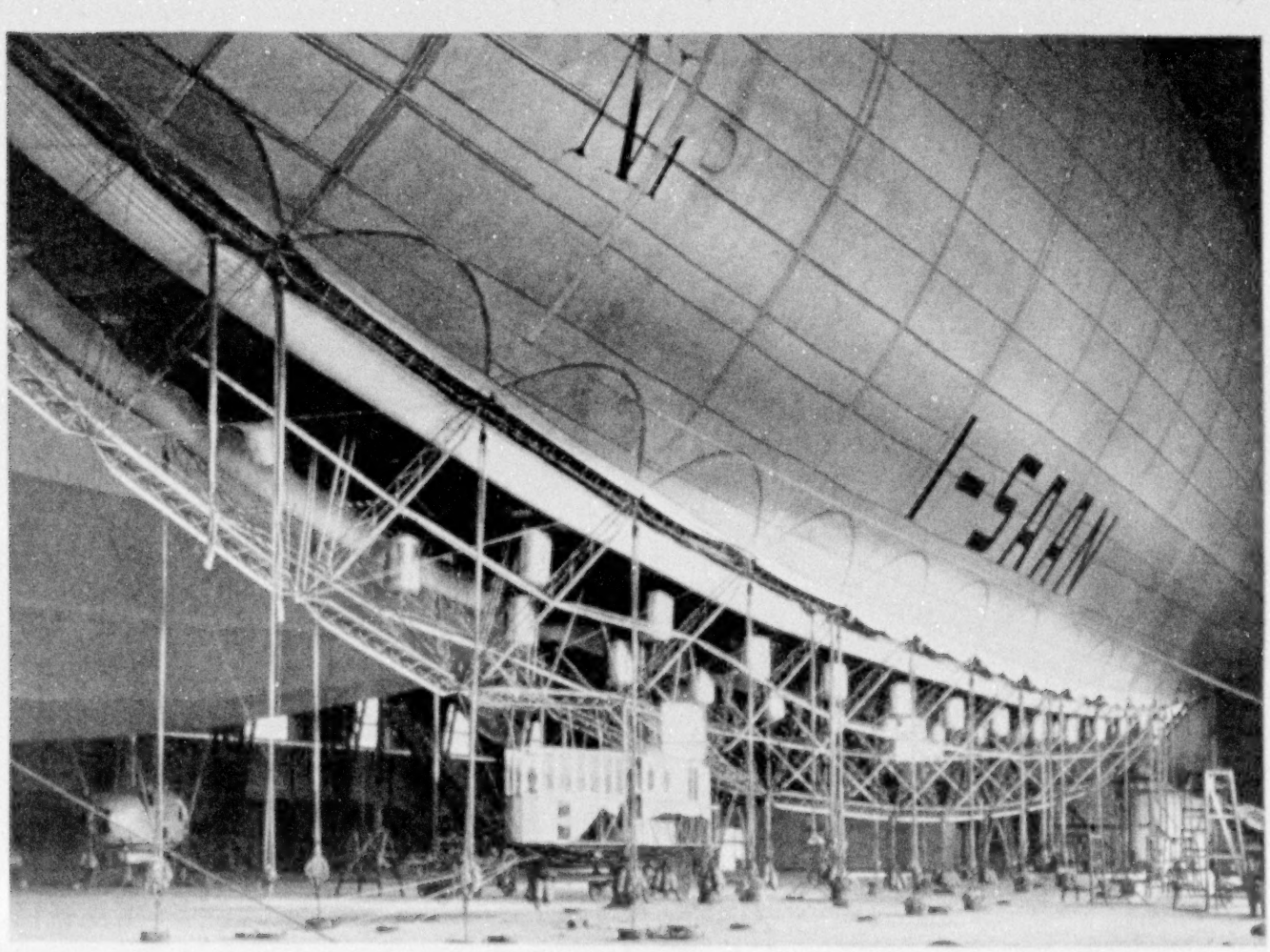
Each engine is supported by means of a metallic framework, which externally presents a shape for good penetration. These engine boats are suspended from the framework of the ship by means of metallic ropes and laterally are connected with the framework by two beams, one of which is used also as a catwalk for the engineers when they go from the engine boats to the inside of the hull or *vice versa* (see page 181).

The capacity of the airship is 18,500 cubic meters (about 650,000 cubic feet). Her length is 348 feet, her height 79 feet, and her width 62 feet.

We can assume that the average consumption of fuel is about one kilogram for each kilometer (three and a half pounds, or slightly more than half a gal-



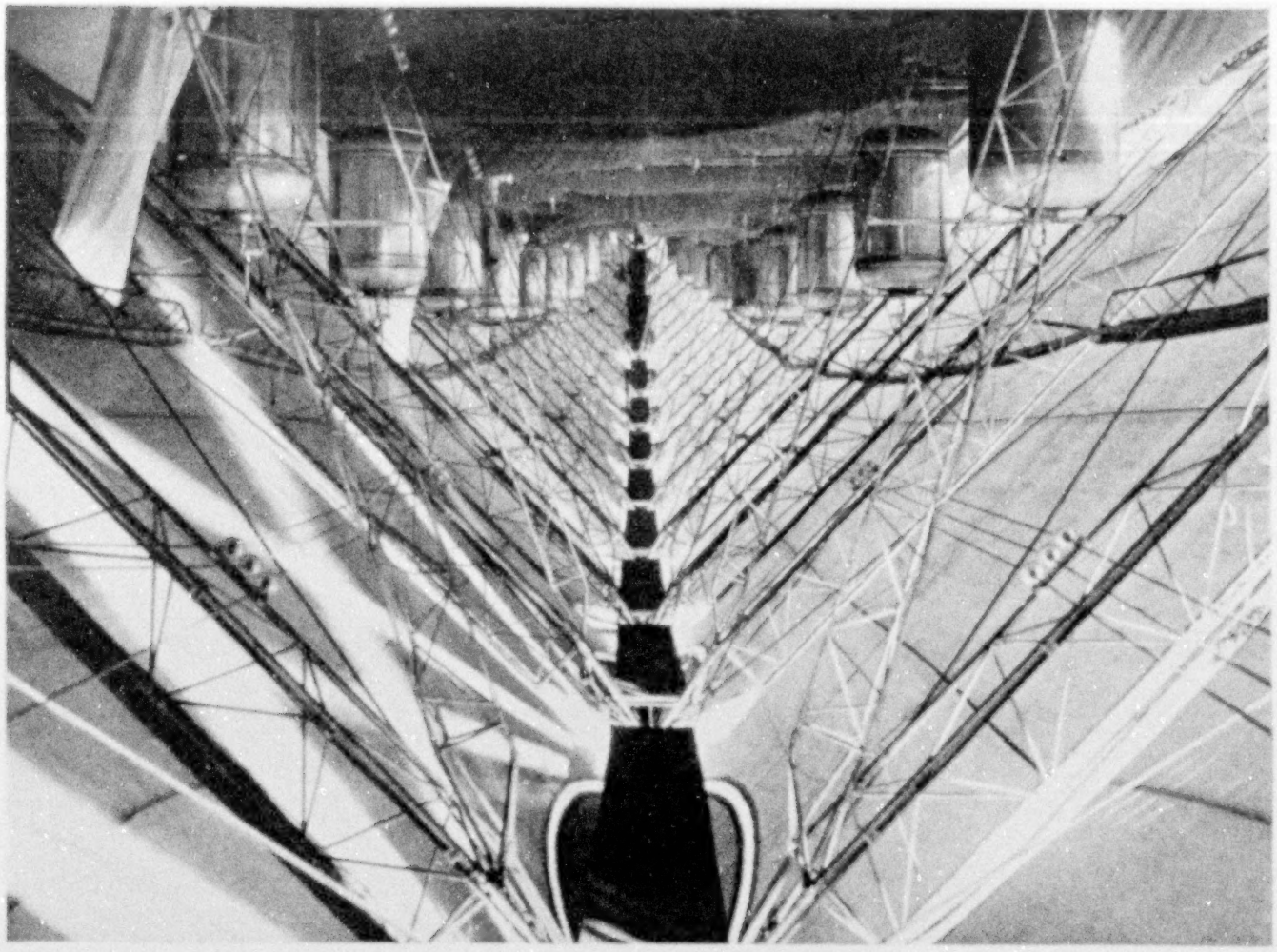
THE REBUILT NOSE OF THE "N-1" (SEE, ALSO, ILLUSTRATION ON OPPOSITE PAGE)



Photographs from General Umberto Nobile

REMODELING THE KEEL STRUCTURE OF THE "N-1" FOR ITS POLAR FLIGHT

The 32 gasoline tanks, suspended at intervals on either side of the keel (see, also, illustration, page 180), had a capacity of more than seven and a half tons of fuel, capable of driving the airship, at its most economical speed, a distance of 4,350 miles.



Photograph from General Umberto Nobile

INSIDE THE "NORGE," LOOKING DOWN THE KEEL.

In the semirigid type of airship to which the *Norge* belongs, the keel is stiffened by a triangular-shaped framework of tubing-steel beams, over which is stretched a varnished fabric. The space inside contains the gasoline and water tanks and the control cables for rudders and elevators. The walkway, which runs the length of the keel, connects with the engine boats by means of two gangplanks and a ladder (see illustration on opposite page). There is also a ladder leading up to a hatchway, through which members of the crew have access to the outside of the envelope, at the top of the craft.

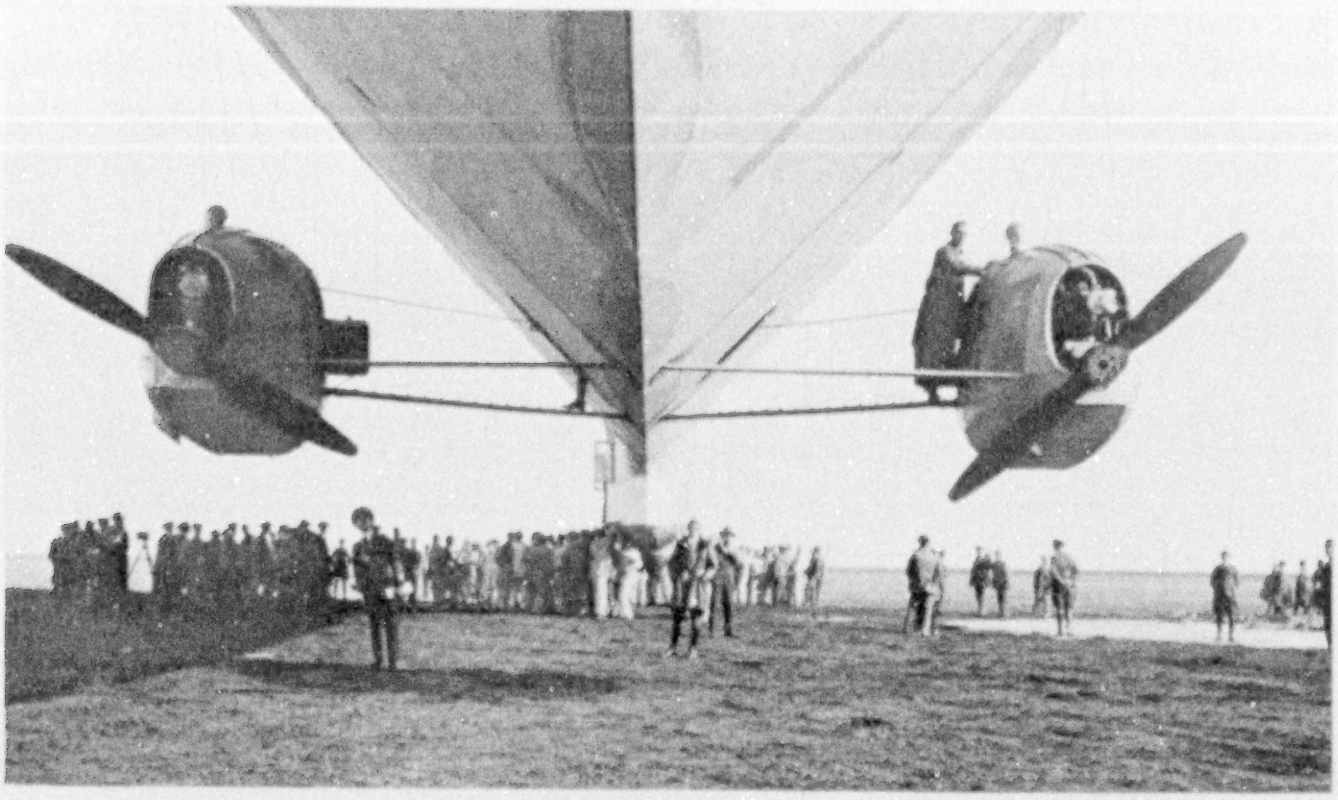
lon, per mile) when the ship flies at about 80 kilometers (50 miles) per hour. The speed might increase to a maximum of 115 kilometers (71.4 miles) per hour; but then, of course, the consumption of fuel increases very rapidly, and consequently the length of nonstop flight decreases also with the same rapidity.

It is useful to recall that one engine is enough to drive the ship at a speed of 60-70 kilometers (37-43 miles) per hour. Such a contingency arose during the crossing of Barents Sea, when for a short time we had two engines out of commission (see text, page 194).

In this Italian type of airship the framework forming the keel of the ship has, I should say, the function that the spine has in vertebrates, and possesses a certain degree of elasticity. This elasticity, together with the flexibility of the upper part of the ship, gives to the whole structure the ability to resist abnormal stresses caused by storm.

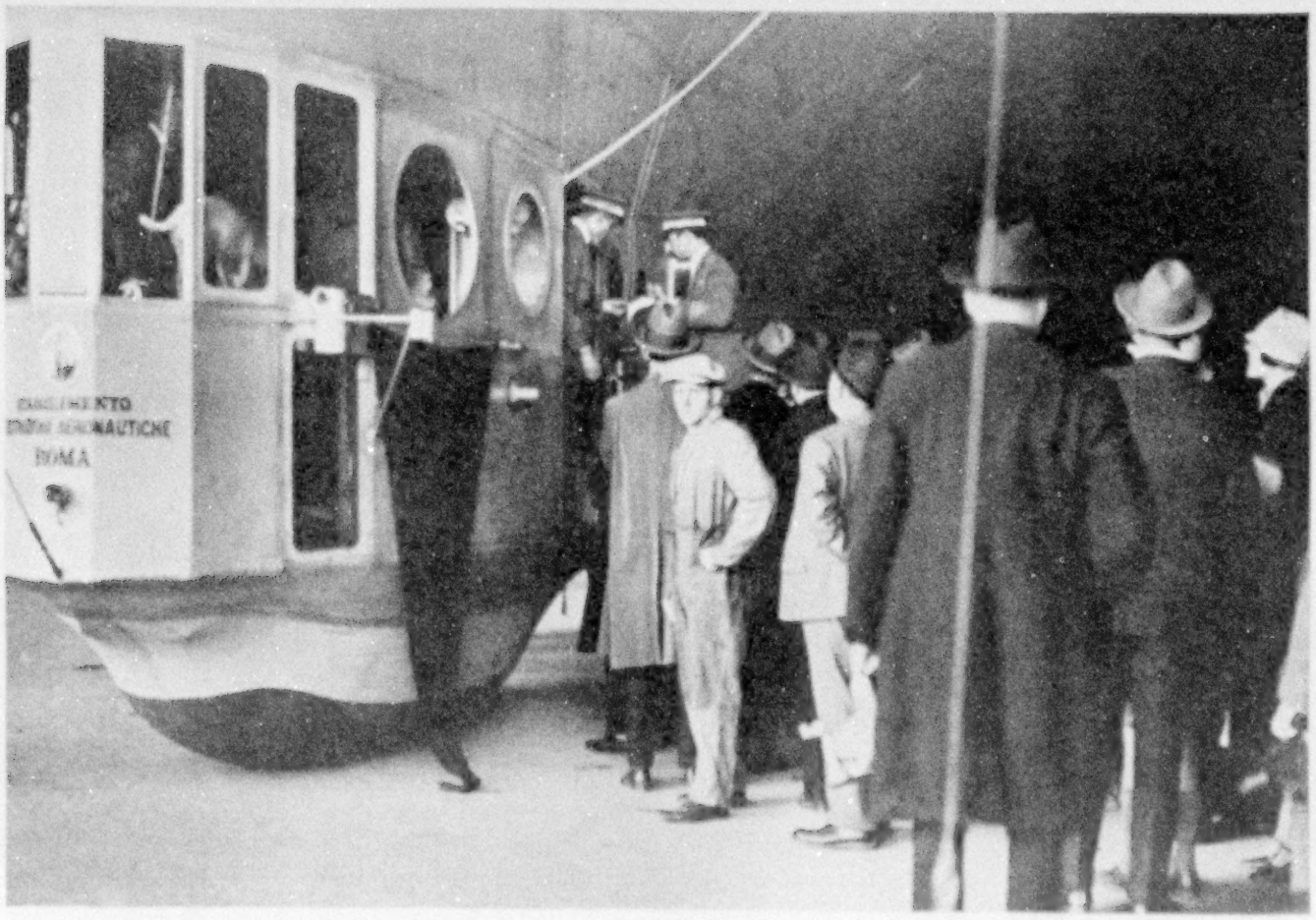
MANY LUXURIOUS FEATURES OF SHIP DISCARDED FOR POLAR TRIP

In her original form the airship *N-1* was wholly unfit for the undertaking, because her useful load was not enough. In order to increase it, I had to lighten the various structures, eliminating all those parts that were not absolutely required, such as the previous cabin de luxe with a magnificent passenger saloon, a bedroom, a washroom, and a kitchen. This cabin was discarded and a small, plain, comfortless pilot cabin was installed. Many other changes were made in the engine boats and other parts of the airship for the same purpose of lightening them in order to increase the useful load.



THE LATERAL ENGINE BOATS OF THE "NORGE," SHOWING THE CATWALK BETWEEN KEEL AND ENGINE BOAT

Note the man standing on the catwalk, at the right, and the foot of another coming out of the hull, on the left.



Photographs from General Umberto Nobile

READY FOR THE DEPARTURE

The original cabin of the ship contained a luxurious passenger saloon, bedroom, washroom, and kitchen. In order to increase the useful load, all of these comforts were dispensed with and a small, severely plain pilot cabin was substituted. General Nobile's dog, Titania, which accompanied him on the flight and subsequently made a tour of America with him, may be seen through the windows of the cabin.

Photograph from General Umberto Nobile

THE "NORGE," LEAVING THE HANGAR ON HER HOME FIELD AT CAMPINO TO START ON HER JOURNEY TO THE POLE

The Norwegian members of the crew came to Rome a month in advance of the departure of the ship, in order to receive theoretical instruction in handling the dirigible, but five Italian specialists accompanied the designer-pilot on the flight (see text, page 183).

The practical result of these modifications was that the useful load, including crew, fuel, and ballast, could reach and sometimes exceed 10,000 kilograms (more than 11 tons). If 7,000 kilograms of it had consisted of fuel, we could have made a nonstop flight of about 7,000 kilometers (4,350 miles) without considering the wind.

But the changes made in the airship consisted not only in lightening the structures, but also in protecting several vital parts against the effects of low temperatures. Besides, we had also to stiffen the nose of the airship to enable us to use a mooring mast. A problem of no less importance was the devising and the preparation of certain special equipment for landing without any help from the ground.

All these modifications entailed long and patient study, and to have forgotten the smallest particular might have meant the failure of the expedition, if not a catastrophe.

PREPARED TO REMAIN IN THE AIR FOR A MONTH

When the work was finally completed the *N-1*, rechristened *Norge*, was prepared, if the necessity should arise, to remain in the air for a whole month at a time, navigating as a free balloon, or to land on the sea or on the ground without any outside aid.

The preparation for the flight from Rome to Spitsbergen was not the least arduous of our tasks. We built in Rome and sent to the various European bases not only mooring masts, but spare parts required both for the upkeep of the ship and as accessories for the masts and hangars.

The roofless hangar erected at Kings Bay, Spitsbergen (see illustration, page 202), was an Italian idea, for the realization of which I found it necessary to make several tunnel experiments.

One of the most important phases of the preparations was the selection and training of the crew. The five Italian specialists who accompanied me during the entire flight were chosen from among experts both in the handling and in the building of airships. Each had acquired his experience through years of work in the shops, as well as by hundreds of flights.

The Norwegian members of the crew came to Rome about one month before the expedition started, to receive theoretical and practical instruction, but in that limited time their training was necessarily "sketchy." It seemed advisable, therefore, to send to Norway, Russia, and Spitsbergen some Italians—both technicians and workmen—expert in the upkeep and maneuvering of the airship.

AËRO CLUB OF NORWAY IN CHARGE OF FINANCIAL ORGANIZATION

The Aëro Club of Norway coöperated admirably in the preparation of the bases in Norway and at Kings Bay. This organization was also primarily responsible for the financial organization of the expedition—not an easy task! The financial contribution of the Italian Government was one-third of the total cost of the expedition, while Mr. Lincoln Ellsworth generously provided one-sixth. The largest part of the remainder was obtained through contracts with the press and motion-picture firms.

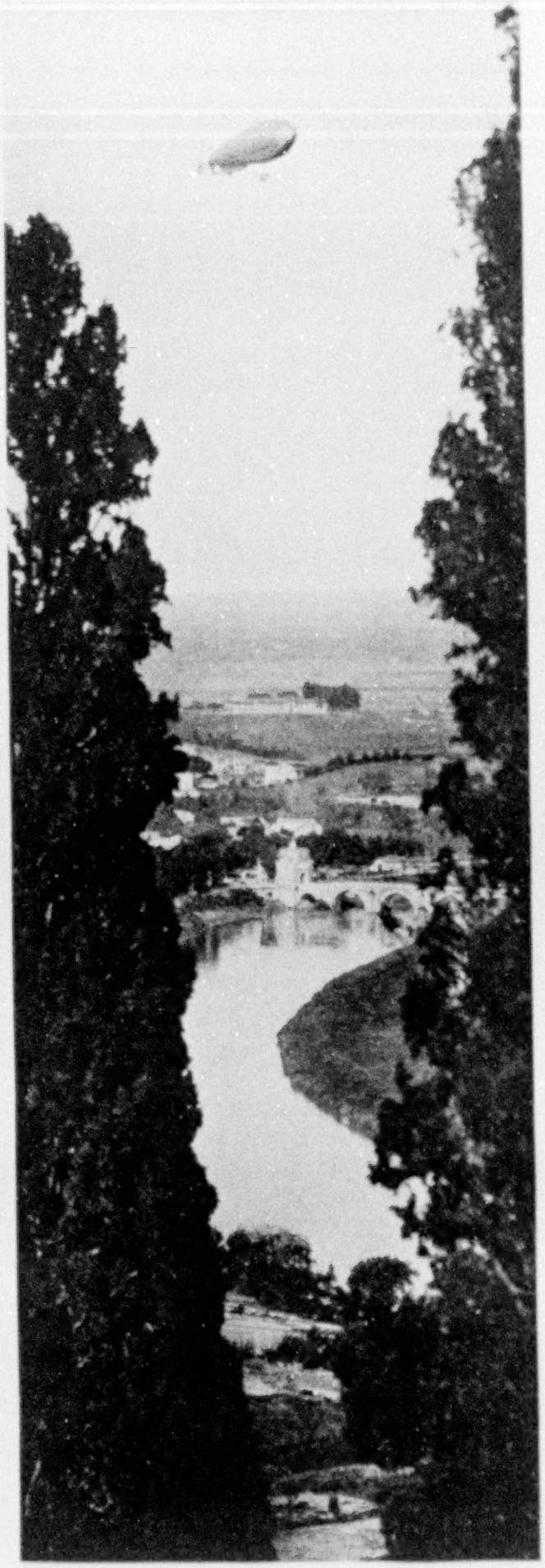
Captain Gottwaldt, of the Norwegian Navy, with the assistance of Italian experts, installed the Marconi apparatus on board at our military factory in Rome.

While the physical obstacles overcome were numerous and difficult, the discouragement and pessimism encountered on every hand were even harder to conquer.

MORALE OF STAFF MAINTAINED DESPITE VIOLENT CRITICISM

The bitterest criticism was directed against the small size of the airship, the autonomy of which in aëronautical circles, both in Italy and abroad, was held to be absolutely insufficient. To most of our critics, the idea of crossing the Polar region with an airship only one-seventh as large as that which the Germans had planned for the same purpose seemed outright madness. We were mercilessly lampooned in the press. Sketches were published showing our ship wrecked on the Polar ice and our men taken to safety by a large German dirigible.

Our success seemed so unlikely to some of our malignant critics that they even suggested that our preparations were merely bluff, and that at the proper moment some good excuse would be found



Photograph Courtesy of Royal Italian Embassy

ROMEWARD BOUND

Tall poplars reach up as if to touch this silver ship of the Italian aërial fleet, from which the *N-1*, renamed *Norge*, was requisitioned by Premier Mussolini for the North Pole flight.

for our failure to start. So pervasive was the idea of a failure that some newspaper correspondents were dissuaded from boarding the ship with us at Rome.

As if all this were not enough, some one even tried to warn my companions against the trip. They, however, had already been informed by me as to the dangers anticipated and had been told that they should look upon the enterprise as possessing only a 50-50 chance of success. Nevertheless, not a man wavered; they followed me with full confidence.

The truth is that neither the ship, small as she was, nor the crew was unequal to the task. The difficulties and dangers were many, but all lay outside of ourselves and of our ship. If we wanted to succeed, we had to meet external conditions with that spirit which is born in a man when he has taken a firm decision to win or to perish.

It was thus I answered Russian technical men and scientists of the Academy of Sciences at Leningrad, who later were to warn me against the danger of snowstorm tempests, which, in their opinion, constituted our gravest peril (page 191).

But more dreadful to contemplate than any snowstorm was the thought that our names might be recorded in the history of Polar exploration as those of madmen if, notwithstanding every preparation, the adverse forces of Nature and of the unknown should triumph over us.

THE "NORGE" SALUTES THE ETERNAL CITY; THEN STARTS FOR THE POLE

We started from Rome on April 10, 1926, for the long, difficult, and dangerous voyage to Spitsbergen, beyond which we were to face the unknown.

None could foresee with any degree of certainty when we would return; so we took leave of our loved ones as if we should never see them again.

At 9:30 a. m. I gave the signal for the departure. I was so occupied with the ship that I could not even lean out of the cabin to wave good-bye to my dearest ones, who were on the field; but I was carrying in my heart the image of the pale visage of my little daughter, and there still resounded in my ears the last words whispered to me by my wife.

The motors started, and our flag, unfurling below the commander's cabin,

flew to the breeze in all its glory in the dazzling sun of a Roman spring.

The *Norge's* prow was turned toward the heart of the city, to salute it. We looked down upon the Quirinal, the Capitol, the Vatican, and the workshops where we had designed and built our ship. I am told that the bells of the churches rang out in salutation and good wishes, and that an unknown priest, when he saw us pass high above him, knelt down in the street to pray (see pages 186, 187).

It was a magnificent day—blue sky, calm sea.

We proceeded along the coast, past Palo, then Civitavecchia. From time to time a message of good wishes reached us by radio. I sent greetings to the King, who was at San Rossore, his summer estate on the Tuscan coast; then to Premier Mussolini, on board a ship on his way to Tripoli.

On and on we went. There was the Giglio Island, then Elba, and beyond, Corsica. We steered to the left, toward France. We were leaving Italy.

OVER THE FRENCH COAST AT DUSK

At dusk we reached the French coast. Then began the long run through the starry night up the Canal du Midi. For a time we were aided by a strong wind, which occasionally reached a velocity of nearly 40 miles an hour.

Weather reports and forecasts received by radio were contradictory. According to some, Pulham, 90 miles northeast of London, which was the goal I had secretly in mind from the start, could be made; according to others, it was dangerous to try to land there, because of a low pressure advancing from the west.

Rochefort was reached at midnight. The field was all illuminated, the gates of the hangar were opened, and the men ready for maneuvering. The commander of the aëro station telegraphed that we could land but could not get into the hangar, owing to the strong breeze; so I decided to proceed to London direct.

The wind, which had been favorable up to this time, now veered around and began blowing so strongly against us as to reduce our speed to a few kilometers per hour. At dawn the squalls increased to such an extent that the pitch and roll of the ship assumed alarming proportions whenever I approached the ground in the hope of finding more favorable conditions.

Navigation under these disturbed conditions continued over northern France as far as the coast, and then over the English Channel and England.

These were seemingly endless hours, full of stress, for if the wind should increase in velocity our supply of gasoline would soon be depleted and we would then be in the clutches of the storm, with the possibility of being driven out over the Atlantic, without any chance of safety.

Even before we encountered these storm conditions, my strength was nearly exhausted, as I had not had a moment's rest from the hour of our departure; but I rallied all my reserve to keep the ship in hand. The only mishap was a broken ring in the tail.

FIRST NONSTOP LEG OF THE JOURNEY WAS 1,400 MILES

Finally, after we had passed beyond London, the wind began to abate, and by the time we reached Pulham, at 3:20 in the afternoon, atmospheric conditions were considerably better. After a very long and difficult maneuver, we landed at 5:50, having covered 1,400 miles in 32½ hours (see pages 191, 192).

A careful examination of the *Norge* revealed the fact that she had performed the initial leg of the journey in wonderful fashion. We had only to renew our supply of gasoline and oil and inspect the motors, this work being done with the usual alacrity by Cecioni and his Italian companions, with the cordial coöperation of the Englishmen, who took care of the maneuvering and placed their weather service at our disposal.

THE FIRST FLIGHT FROM LONDON TO NORWAY'S CAPITAL

On the evening of April 13 we were ready to start northward again, and at 11 o'clock we sailed.

The air journey from Pulham to Oslo, capital of Norway, although then effected for the first time, did not offer any experiences or incidents of note, save that the fog over the North Sea hindered the control of the route for a few hours,

Photograph Courtesy of Royal Italian Embassy

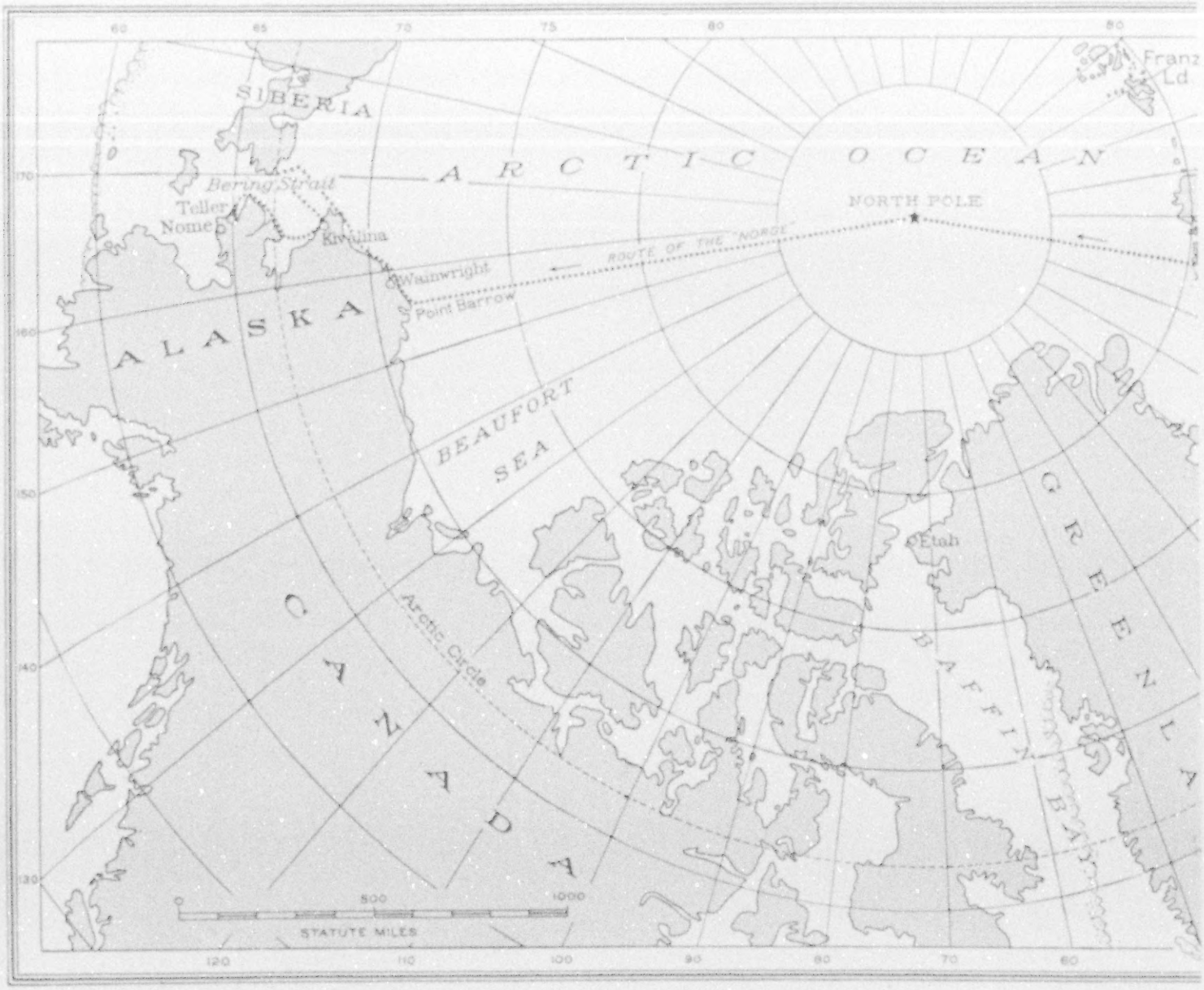
THE "NORGE" SALUTES THE ETERNAL CITY BEFORE STARTING FOR THE POLE

The Colosseum may be seen on the left and the Tiber at the upper right. The modern buildings in the central foreground are public schools, while the church just to the right of the center and adjoining one of the schools is San Pietro in Vincoli, in which is Michelangelo's famous "horned" statue of Moses.

Photograph Courtesy of Royal Italian Embassy

THE GRANDEUR THAT WAS AND IS ROME: PHOTOGRAPH TAKEN FROM A GREATER ELEVATION THAN THAT ON PAGE 186

Probably in no other place in the world can so many historical landmarks be seen in one "eyeful" as from an airship over Rome. The Colosseum and Forum may be identified to the left, the Vittorio Emanuele III Memorial in the left center, Saint Peter's and the Vatican at the upper right, and the twisting Tiber flowing through the city. The dark area at the lower right is a large park, the Villa Borghese, which is connected with the Pincian Gardens by a white marble bridge, conspicuous in the photograph. In the lower left corner is Rome's main railway terminal, and the adjacent circle faces, on its open side, the ruins of the Baths of Diocletian.



THE ROUTE OF THE "NORGE" FROM ROME TO ALASKA

Only three stops were made on the voyage from Rome to the Arctic base at Kings Bay, Spitsbergen—Pulham, England; Oslo, Norway, and Leningrad, Russia. One of the most difficult stages of the journey was encountered shortly after crossing Lake Ladoga, when for seven hours the ship was buffeted by a tempest (see text, page 193).

causing a deviation toward the Danish coast. However, with this exception, the navigation was easy.

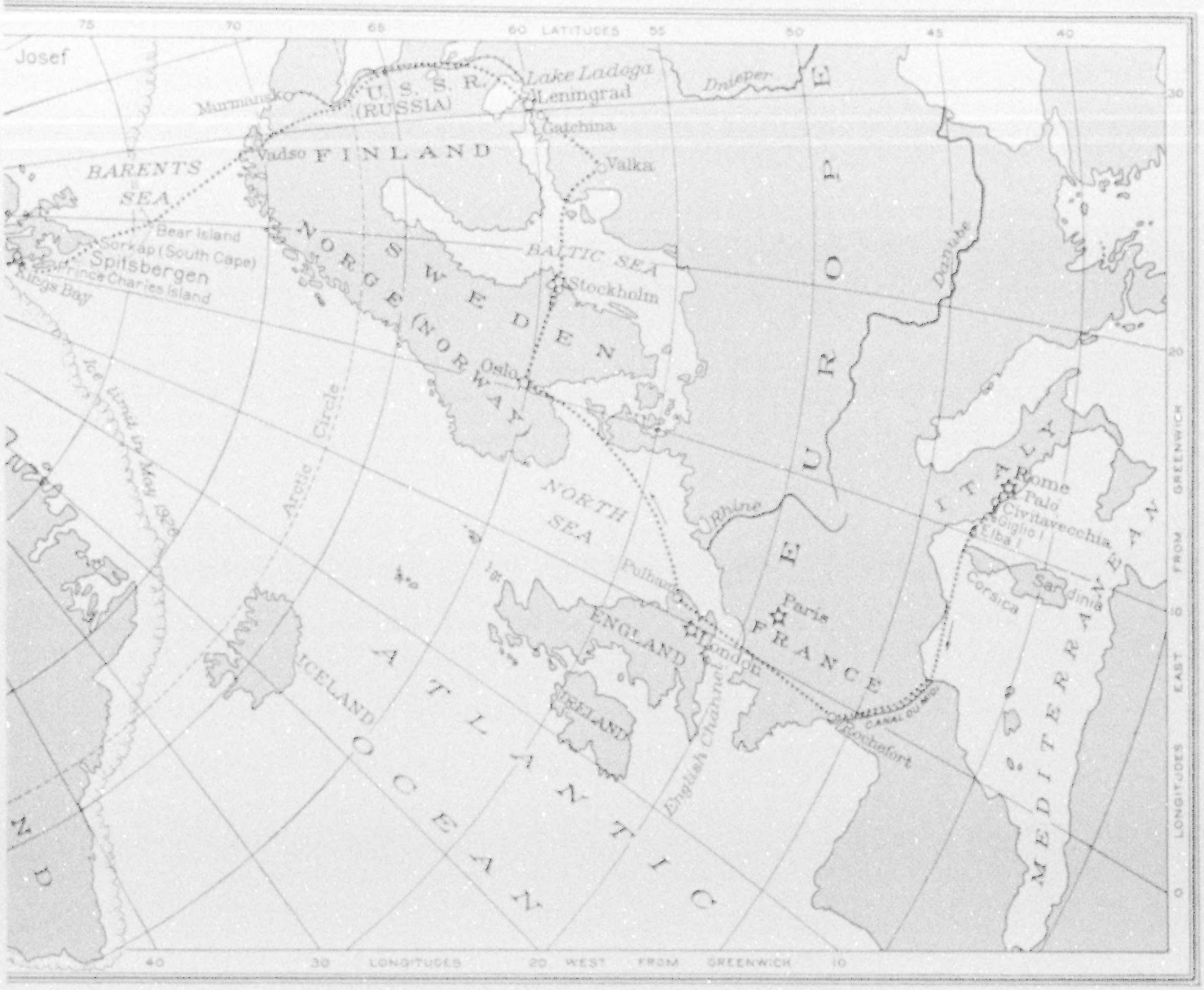
We arrived at Oslo about 1 o'clock in the afternoon. The city, bathed in beautiful spring sunlight, offered a magnificent spectacle, with thousands upon thousands of people gathered on the roofs of the houses, on verandas, in the streets, and in front of the royal palace.

We remained at Oslo, moored to a mast only for the afternoon. During the night we departed in a dense fog, which for some hours prevented us from seeing the ground, so that we crossed the Scandinavian Peninsula and the Baltic Sea without recognizing any landmark. When we reached *terra firma* again the fog dispersed, and in order to reconnoiter our position I turned southward as far as Valka (on the Esthonian-Latvian border), from which point we steered directly toward Gatchina.

The run above the Russian plains, with their snow-clad forests, vast and solitary and somber at sunset, and our arrival at Gatchina are among the most vivid recollections of our European flight.

HOODED RUSSIAN SOLDIERS WAIT TO RECEIVE THE "NORGE"

It was far into the evening when we reached Gatchina, but the whiteness of the snow served to illuminate the field, bringing out into a queer relief the monastical figures of the Russian soldiers,



Drawn by A. H. Bumstead

A FLIGHT OF 8,500 MILES ACROSS THE TOP OF THE WORLD

From the North Pole to Point Barrow, Alaska, the *Norge* was flying over a part of the globe never before seen by man. Here the dirigible encountered snow and fog which hourly threatened disaster. The flight ended at Teller, Alaska, where the ship was finally dismantled, and the engines and framework were crated and shipped back to Italy.

with their hoods and their long yellowish capes. In accordance with prescribed regulations, they were disposed in two converging rows, ready to receive us.

The landing at Salizy air station took place at 6:50 p. m. (Oslo time) in routine fashion. Half an hour later the *Norge* was safely moored inside the hangar. From Pulham to Gatchina we had covered 1,700 land miles (page 197).

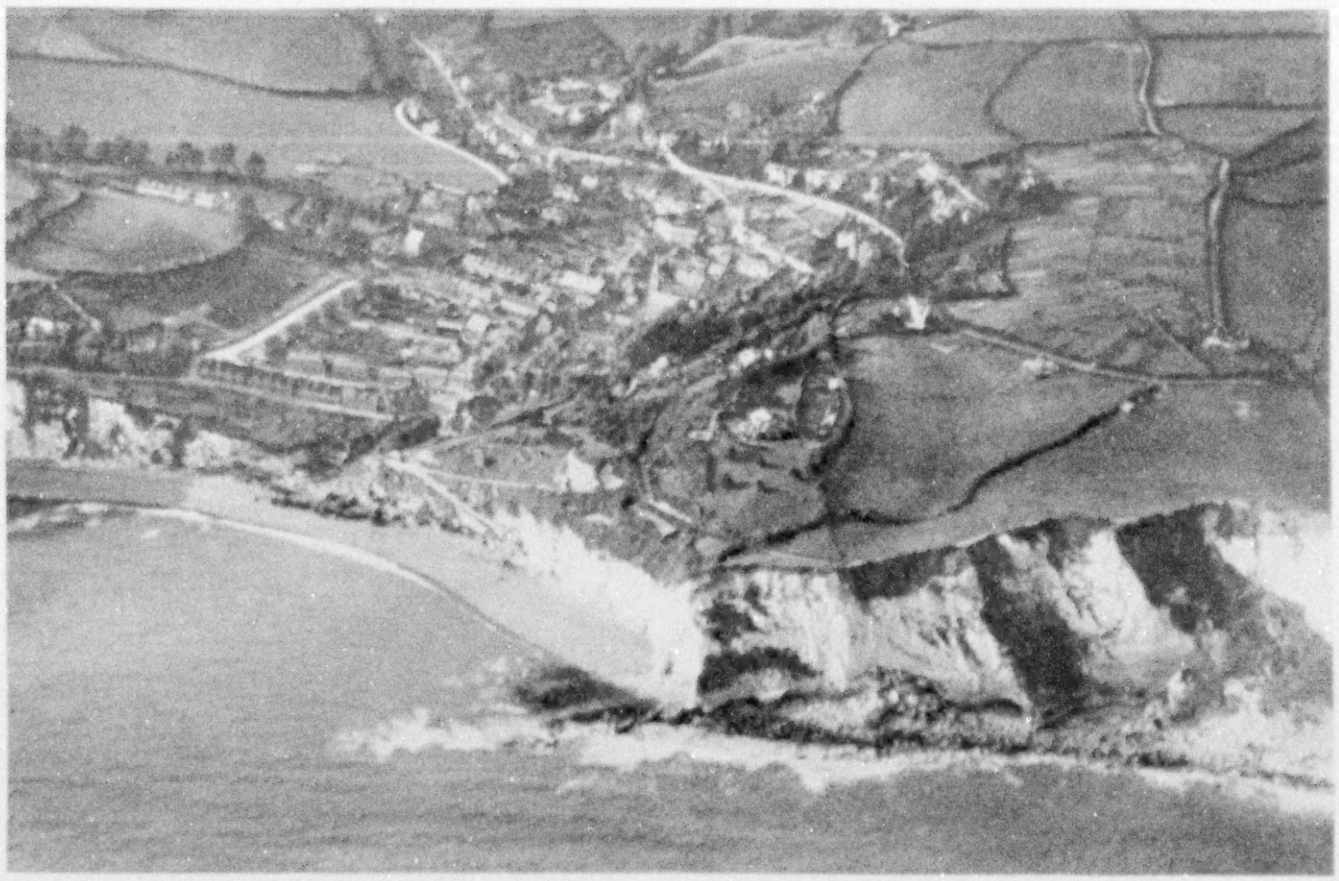
With the ship secure, we departed by sledge for the Imperial Palace. We had arrived in Gatchina on April 15, the exact date which I had announced to the Russian authorities four months before. I was greatly pleased over this punctuality.

During our sojourn in Russia government officials, technical men, scientists, and the people generally vied with one another in their efforts to be useful and to show their friendly interest in us.

The assistance rendered by the military aëronautical authorities was whole-hearted and all my requests were eagerly complied with.

THE AIRSHIP BECAME A PLACE OF PILGRIMAGE FOR ALL CLASSES OF RUSSIANS

The meteorological and the radio-telegraph bureaus rendered valuable aid in forecasting the weather, while the technical staff, especially the engineers of the Institute of Communications, spared no effort to show their friendliness and their interest in our undertaking.



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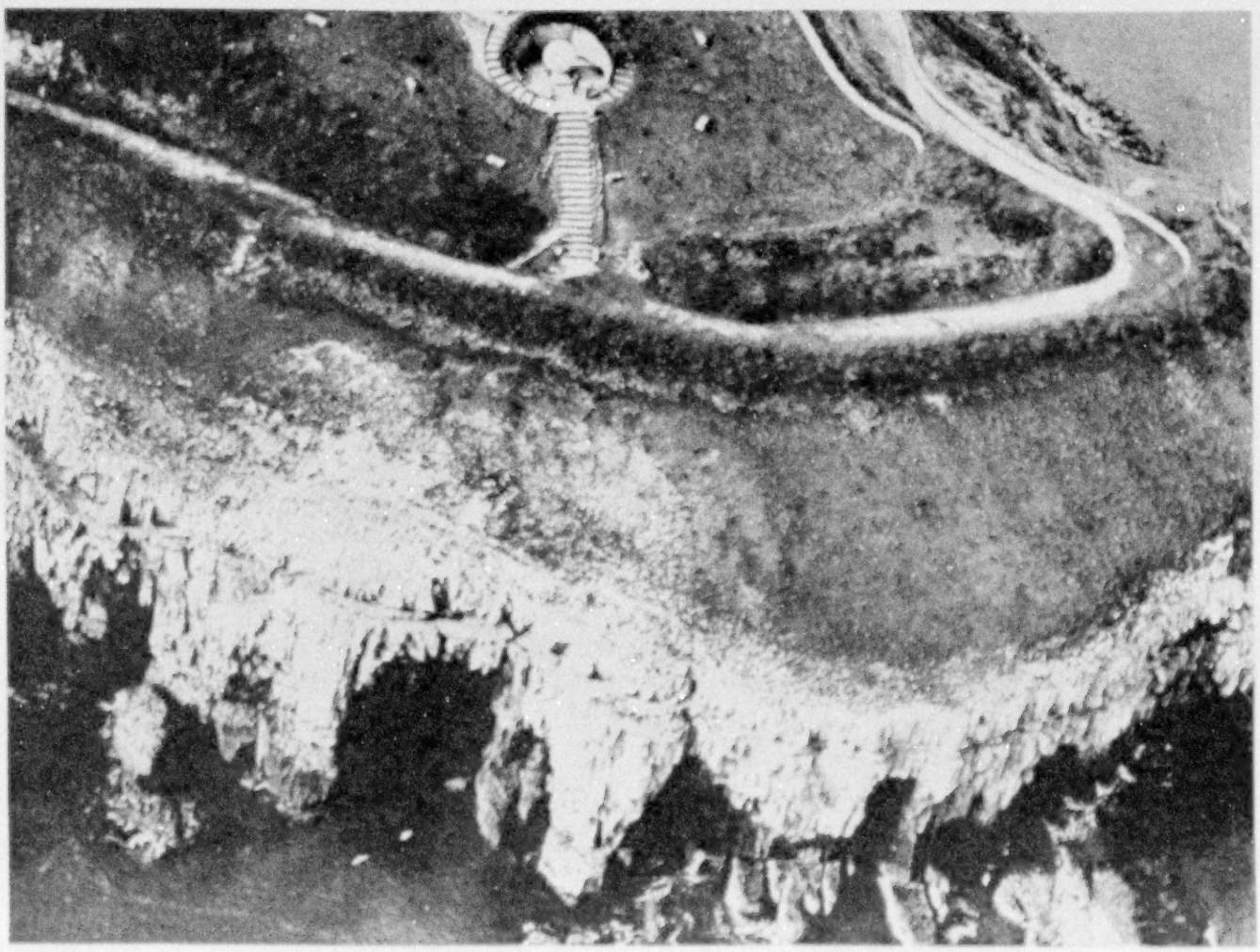
AN ENGLISH SEASIDE VILLAGE FROM THE AIR



Photograph by Aërofilms, Ltd.

SWANAGE FROM THE SKY

This plain, surrounded by sheer white cliffs rising out of the blue sea, was the scene of one of King Alfred's victories over the Danes more than a thousand years ago. The most conspicuous feature of Swanage, in Dorsetshire, seen from the air, is a rounded bowlder, ten feet in diameter and weighing 40 tons, on which has been chiseled a relief map of the world.

© Underwood & Underwood

THE "NORGE" NEARING PULHAM

The ship arrived over the English air port at 3:20 in the afternoon, but the landing was not accomplished until two and a half hours later (see illustration, page 192). Two days after, at 11 p. m., April 13, 1926, she resumed her journey and the first flight from England to Oslo was begun (see text, page 185).

A reception was given in our honor by the Academy of Sciences of Leningrad.

During our stay thousands of people flocked to Salizy every day to see the *Norge*. Many of our visitors came from distant places, at great expense and with much discomfort—men, women, functionaries, officers of the army, students, engineers, professors, and whole schools of children accompanied by their teachers. They would enter the hangar in an orderly fashion, walk around the airship, eagerly ask and receive information, and then leave.

How many pleasant incidents! I shall never forget the friendly curiosity of two young men, students or workingmen, who insisted on seeing the Italian flag preserved on board; nor will I soon forget the sympathetic expression with which a lady attached to the Meteorological Institute, after visiting the ship, took leave of us, repeating several times, "God protect you."

At the Academy of Sciences of Leningrad, Professor Rynin said:

"The problem confronting you in penetrating into the Polar region, exploring the North Pole zone, and reaching the Pole of Inaccessibility, frightens and seduces at the same time, and compels us to bow our heads before the audacity and the energy of those who intend to attain this goal.

"We, aëronautical engineers and pilots, are fully alive to the difficulty of solving the problem you have set yourselves and are unable to banish the fear that you may find unforeseen dangers, obstacles caused by the elements and above all by snow, in that Polar region which is still practically unexplored from the meteorological point of view. For these reasons we cannot remain indifferent toward your enterprise and shall await with anxiety the news of your safe arrival in Alaska."

Such expressions are the best evidence

Photograph by Pacific and Atlantic

THE FIRST STOP: SETTLING TO EARTH AT THE PULHAM AIRDROME

The first leg of the journey from Rome to Pulham, a distance of 1,400 miles, was made in 32½ hours. It was on this same field that the British dirigible *R-34* landed after successfully making the trip across the Atlantic Ocean to the United States and back in 1919. The *R-34* was nearly twice as long and had a gas capacity three times as great as the *Norge*. She made the return trip from America in 75 hours.

of the apprehension felt by the Russian experts with regard to the outcome of our expedition.

Our sojourn at Gatchina was much longer than I had anticipated. I had planned to make a careful inspection of the motors, to eliminate the reversing gear from the only motor which was provided with it, and to strengthen the ring which had been damaged at the tail of the ship while crossing northern France (see text, page 185).

One week would have been sufficient for this work, and we could then have proceeded to Spitsbergen; but the news concerning the work being done at our base was far from encouraging. Our personnel, headed by Major Vallini, had not arrived there until April 25. I telegraphed to him to hurry the preparations, but the work on the hangar and the mooring mast was considerably delayed, largely on account of a severe snowstorm.

SPRING SMILES AS THE DIRIGIBLE LEAVES LENINGRAD

Early in May, however, I received word that Kings Bay was ready to receive us, and on the morning of the fifth, with a contrary north wind blowing at a velocity of from 20 to 30 miles, we bade farewell to our Italian friends and the

Photograph from General Umberto Nobile

THE "NORGE" ARRIVING OVER OSLO

Boat whistles, pealing bells, screaming sirens, and prolonged cheers greeted the appearance of the airship over the Norwegian metropolis. The Aero Club of Norway was the official sponsor of the expedition.

Russian authorities and set sail at 9:30 for Vadsö.

No sooner had the motors started than the fight with the wind began, the squalls causing the airship to jump and plunge alarmingly, as we proceeded toward Leningrad.

At 10:22 a. m. we were over the harbor of the former capital of the Russian Empire, and the sirens of the steamers blew their greetings to us as we followed the course of the Neva, its blue water flecked with white ice floes.

We sailed at a low altitude over the Winter Palace and the Prospekt Nevski, the most famous thoroughfare of the once great metropolis.

In the brilliant May sunlight Leningrad cast off its gloomy aspect of a fallen city and seemed very beautiful in the limpid air, with the sun shining for the first time in 20 days. And the apparent splendor of the city was soon accentuated by the vast, monotonous, snow-covered plain surrounding it.

We crossed the ice-covered Lake Ladoga, over which navigation was less bumpy, but beyond that body of water the squalls began with a violence even greater than before. The airship would proceed by fits and starts—a queer behavior never previously observed. At times it seemed that the craft had stopped. Finally, after seven hours of torture, the tempest began to abate, and the second half of our journey was effected smoothly.

FLYING BEFORE THE NIGHT

The landscape during this entire leg of our voyage was cheerless. We passed over an immense plain of forests, swamps, and snow, with only an occasional glimpse of an isolated village huddling close beside the Murman Railroad.*

That night the sun set at 10 o'clock,

*See "The Murman Coast, Arctic Gateway for American and Allied Expeditionary Forces in Northern European Russia," in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1919.

Photograph from General Umberto Nobile

BETWEEN NORWEGIAN FLAGS

Norway's capital is beautifully situated at the head of one of the countless fjords that indent the coast. It is a well-built city, surrounded by attractive suburbs. Because of an equable climate and excellent sporting facilities, the vicinity of Oslo is popular both as a summer resort and as a winter playground.

but between twilight and dawn the light never failed. Inside the ship was nearly dark; but outside, the light, coming from the north, enabled us to see fairly well. It seemed as if we were flying before the night. How queer one feels when compelled to look northward for light!

At half past 2 in the morning the sun was again above the horizon, and now it would not go down for many days. In fact, we saw a sunset again only after reaching Teller, Alaska.

It was cold on board the *Norge*. The temperature outside was 16 above zero. Fahrenheit; inside, 23 above.

At about 4:40 a. m. one of our motors went out of commission, but we proceeded satisfactorily with the other two. When we reached Kings Bay we found that the crank shaft of the disabled power unit had broken.

At 5:30 a. m. we reached Vadsö, a small Norwegian village gracefully located by the sea. It seemed almost beautiful after the gloomy landscape over which we had been passing for nearly 20 hours.

We came to rest at the mooring mast erected by our lamented friend Rossi, and found that we had more gasoline on board than was sufficient to get to Kings Bay; but, as a matter of precaution, we took in a further supply.

THE FIRST SNOW CAUSES ANXIETY

We left Vadsö at 3 o'clock in the afternoon, to begin the somewhat dreaded crossing of the Barents Sea; but it proved far less exciting than I had anticipated.

The sky was cloudy and the wind was raising foam-capped waves, but the squalls were of only moderate force, so that the pitching and rolling of the airship could be easily endured. More than once we encountered rain and snow, and when the latter first attacked us I naturally felt some anxiety; but nothing abnormal happened.

At 10:45 p. m. we passed over Bear Island, where the compass showed the well-known magnetic disturbances pe-

culiar to that locality, and a few hours later we could discern the mountains of Spitsbergen dead ahead. We passed Sörkap (South Cape) at 2:20 a. m.

At this point the fog overtook us, but it was not so high nor so thick as to render the mountains invisible. The coast line was readily discernible. When Prince Charles Island was reached, I directed the *Norge* away from the Channel, so that I could regain the sea should the fog envelop us.

SAFELY BERTHED AT THE GATE TO THE POLE

While Larsen, assisted by Horgen, kept the ship to her course, I gave all my attention to preparations for the landing. I was in wireless communication with my brother, who was at Kings Bay, and he warned me that visibility was bad. However, conditions soon improved, and about 6 o'clock in the morning, when we entered Kings Bay, we could see the hangar, a blackish spot on the white background of snow (p. 200).

Photograph from General Umberto Nobile

THE MOORING MAST TO WHICH THE "NORGE" WAS MADE FAST DURING HER BRIEF STOP IN OSLO

The mast was constructed partly in Norway and partly in Italy. It was in actual use for about ten hours only. Note the two small balloons used to determine wind direction and velocity (see, also, page 203).

At 6:40 a. m., May 7, after a short reconnaissance of the field, we landed very smoothly upon the snow. Captain Amundsen, Mr. Ellsworth, Major Vallini, Captain Precerutti; my brother, many Italian specialists and workingmen, Captain Nielsen, commander of the steamship *Heimdal*, with his sailors, and many others were there to receive us. With skill and dispatch the airship was taken inside the hangar and moored. Thus the first part of our flight had been accomplished (see page 201).

After so much agitation, we were at last at the gate to the Pole, ready to make a dash for it.

It was not without deep emotion that I heard the sailors of the *Heimdal* sing our national anthem, together with those of America and Norway: a solemn and unforgettable moment, which compensated me for all hardships and anxieties.

We turned in, expecting to take a real rest; but one hour later, having found it impossible to sleep, we resumed our work.

Three days after our arrival at Kings Bay we were ready to start for the Pole. During those three days, although com-

© Pacific and Atlantic

MOORED TO THE MAST

The development of the mooring mast has greatly simplified the ground handling of airships. In making fast to a mast the ship drops a 1,000-foot rope, which is secured to another rope leading from a winch at the base to the top of the structure. The winch then hauls in the ropes and draws the ship to the masthead.

pelled to work in the open, at temperatures of from 5 to 15 degrees above zero, my Italian associates did the work which would usually require ten days. The examination of each part of the airship's structure, the replacement of some damaged parts, the change of the broken motor, the elimination of all useless weights, and then the taking on of a new supply of hydrogen, the loading of gasoline, oil, provisions, and equipment—all this was entrusted to the Italians exclusively, who worked tirelessly day and night.

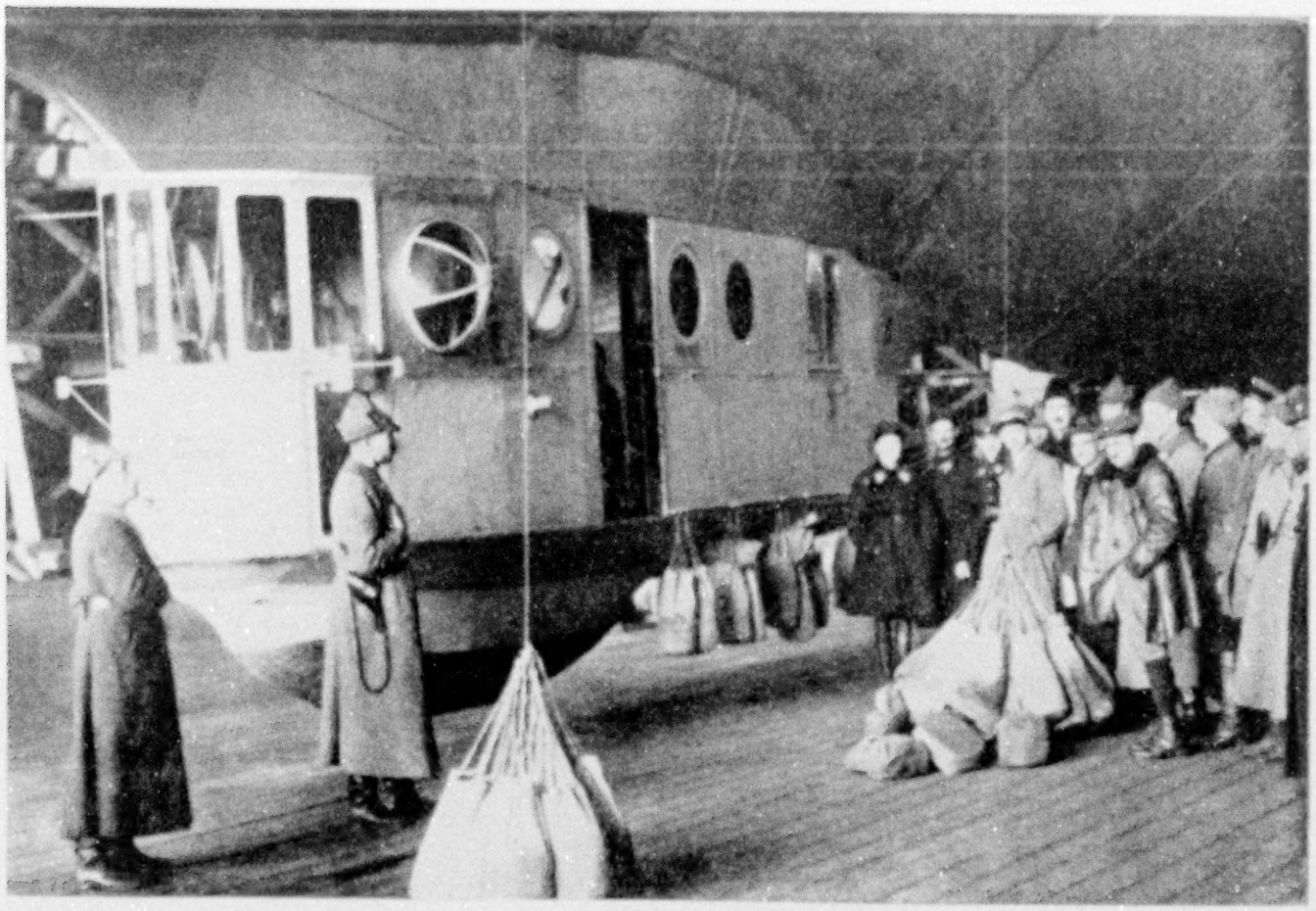
THE FUEL AND SUPPLIES FOR THE POLAR FLIGHT

On the evening of May 10 the ship was ready. We had on board about 7 tons of gasoline and more than 800 pounds of oil, sufficient to cover 4,300 land miles in calm weather; we carried 1,100 pounds of provisions, deemed sufficient to maintain the 16 persons composing the expedition for about 50 days. The provisions consisted of pemmican, chocolate and crackers, meat, condensed milk, marmalade, and coffee.

To the navigating equipment was added an emergency outfit for use in the event of a possible forced march upon the ice—two tents, a sledge, fur bags, knapsacks, skis, and two rifles with ammunition.

We had set the hour of departure at between 1 and 2 o'clock on the morning of May 11, but on account of an easterly wind, which blew against the side of the hangar and made maneuvering very dangerous, a delay of a few hours was imperative.

At 8:50 a. m., Greenwich time, the *Norge* rose slowly. A clamorous ovation saluted us from the ground. When we were 100 feet up, the speed of the motors was increased to one thousand revolutions; then we rose faster, to 150, 200, 300, and finally to an altitude of 1,350 feet (see illustration, page 206).



Photograph from International

THE MEMBERS OF THE EXPEDITION WERE WELL RECEIVED IN SOVIET RUSSIA

The Russian Government made the landing field and hangar at Gatchina (not far from Leningrad) available for the *Norge* on its flight east from Oslo. The people displayed great interest in the ship and the military and other officials extended every courtesy and assistance to General Nobile and his crew (see text, page 188). Note the bags of ballast anchoring the ship to the floor of the hangar.

The weather was magnificent. The sky was blue and the sun was shedding its dazzling light upon the near-by snow-capped mountains of Spitsbergen. Joy filled my heart. That sickly sensation and the weariness which had oppressed me the previous evening and during the night had disappeared. A few hours before I had been numb with cold; now I felt like removing my fur coat!

We had now started on the last stretch of our flight, the *Norge* proceeding at 60 miles per hour toward the Pole and across the great unknown to some point beyond.

EVERY MAN AT HIS POST

On board, Riiser-Larsen had the route watch, Wisting the elevator wheel, Horgen the steering wheel, while Cecioni, inside the hull, assisted by Arduino, watched the motors and regulated the distribution of the gasoline; Caratti was in the engine boat on the left side, Pomella in the central boat, and Arduino and Omdal were to alternate watches in the engine boat on the right side.

The wireless operator installed himself in the cabin, assisted by and under the control of Captain Gottwaldt, who was in general charge of the bearings; Malmgren was entrusted with the recording of meteorological data, and from time to time, with the assistance of Ellsworth, noted the figures on the dial of the apparatus designed to measure the electricity of the atmosphere.

Our zealous Alessandrini had odd jobs: now he was in the hull, now in the little boat to relieve Horgen at the steering wheel; then he would climb onto the back of the airship to find out whether ice had formed there—a task, this, which was anything but pleasant in the wind pressure created by a speed of 60 miles per hour and with the thermometer at 14 degrees above zero.

Horgen relieved Riiser-Larsen on the route watch. Both these Norwegians

Photograph from General Umberto Nobile

WAITING TO HELP BRING THE "NORGE" SAFELY TO EARTH

On the morning of May 7, 1926, the dirigible landed at Kings Bay, completing the trip from Rome to Spitsbergen without mishap. Forty hours were required for the last lap of the journey, and the weary crew was glad to sight the landing parties, drawn up in wedge-shaped formation to receive the ship (see text, page 195).

were naval officers and they did this work skillfully. The bearings during the stretch from Spitsbergen to the Pole often allowed us to check our position. They failed us entirely beyond the Pole, however, when the fog had overtaken us. On the other hand, no special difficulties were presented in keeping to the route during the Polar crossing. The magnetic compass worked regularly, and the sun-compass confirmed its reputation as a magnificent controlling instrument, which enabled us to insure the good work of the other. But between the Pole and Alaska we had no sun.

When we left Kings Bay I felt sure we would easily negotiate the 800 land miles to the Pole, for it seemed improbable that the ideal weather conditions existing at the time of our departure would change materially within the 16 hours necessary to cover that distance at a speed of 50 miles an hour.

What would happen beyond the Pole, in the unexplored region, none could tell; that was the most fascinating and dramatic phase of our undertaking. What meteorological conditions would we encounter? Would we find the chain of mountains which Peary thought he saw from afar? Where and how and when would we land? What would become of us after landing? All these were questions which only the future could answer.

Two hours after leaving Kings Bay, having crossed a free sea, with ice floes scattered here and there, we reached the pack ice. We had left behind us the white mountains of Spitsbergen and Danes Island from which Andrée had started 29 years before, never to return.

At first frequent patches of free water were to be seen in the pack ice; then they disappeared and the uniform ice field was interrupted only by narrow, tortuous channels, prevalently running from southwest to northeast—rare at first, then more and more numerous. Often these channels would run on lines so straight and nearly parallel that they seemed to be artificial.

For a while we caught occasional glimpses of white fishes here and there in the free water; then traces of polar bears

Photograph from General Umberto Nobile

LANDING EFFECTED AT KINGS BAY

Spitsbergen, from which the *Norge* set off for her final dash across the Pole, was probably the Svalbard known to the Vikings in the twelfth century and "rediscovered" by the Dutch in 1596 as a result of their efforts to find a short cut to the riches of the East. It is a bleak, inhospitable, snow-clad land, but possesses considerable mineral wealth.

on the ice; but when latitude 84° N. was reached every trace of life utterly disappeared. The desolate Polar desert stretched to the horizon.

EXCERPTS FROM THE LOG OF THE "NORGE"

At 6:45 p. m. the left motor, owing to the formation of ice in the pipes, stops for lack of gasoline. It is repaired, not without some difficulty; later on the same trouble develops again.

The observations taken at 9:15 p. m. show: altitude 1,650 feet; speed, 37 land miles an hour. We descend to 500 feet in the hope of finding less wind, but in vain. We rise again to 1,335 feet. Clouds begin to form on the horizon, and shortly after 9:30 p. m. the heavens are overcast. The cold begins to make itself felt; the thermometer registers 12 degrees above zero.

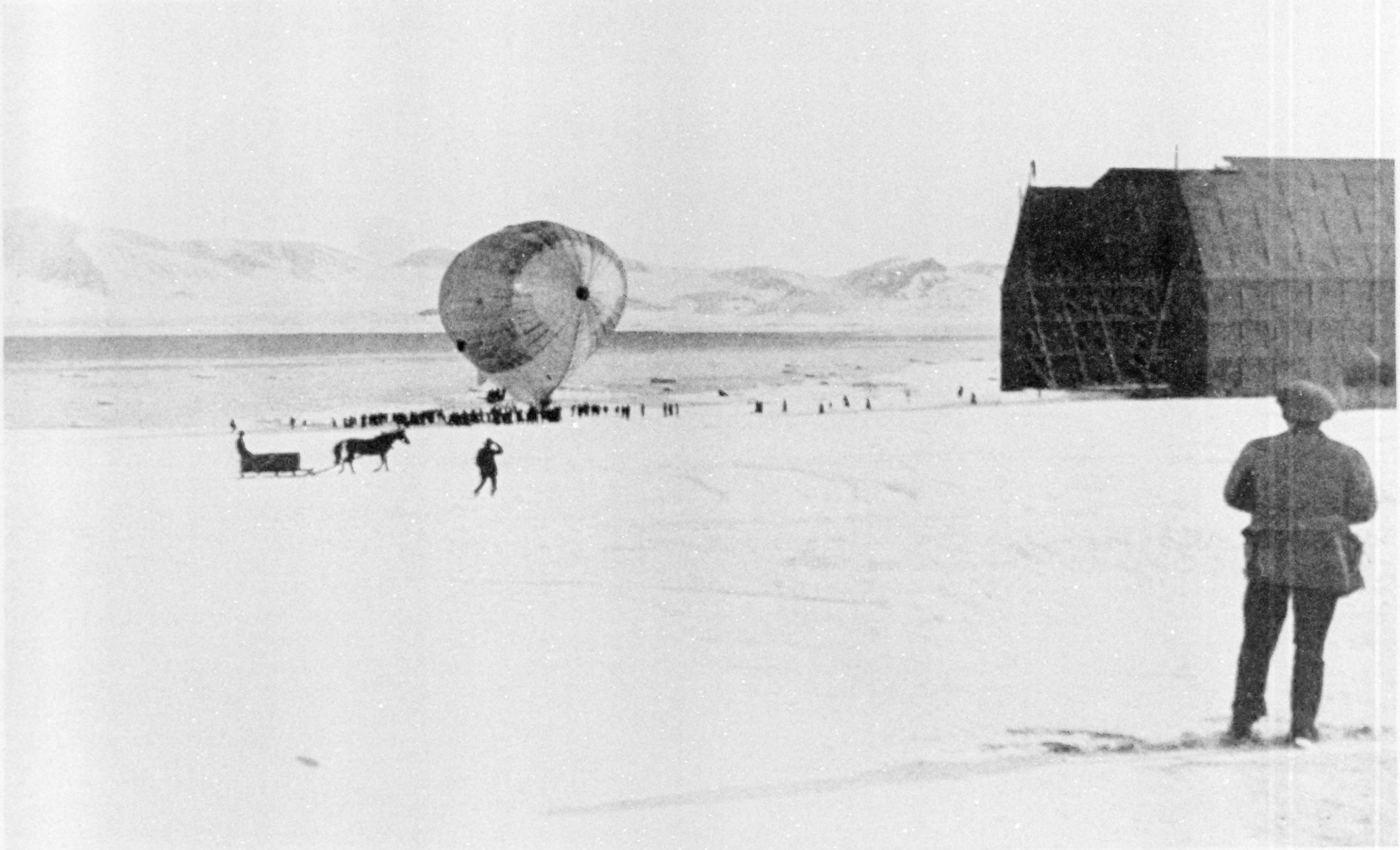
At 10:07 p. m. we are approaching latitude 88°. The sky has cleared again. The channels are becoming more numerous. In a few minutes snow begins to fall.

At 10:30 o'clock we find ourselves enveloped in a dense fog, which in an extraordinarily short time causes the formation of ice on all metal parts exposed to the air, such as cables, instruments, motor-boats, and then on the coated cloth with which the sides of the cabin are covered, and on the small celluloid windows, soon obscuring vision.

We rise to 2,130 feet, but conditions do not improve, and we rise still farther, to 3,160 feet, above the fog.

At 11:15 p. m. we reach latitude 88°30', only a degree and a half from the Pole. The fog is still very dense. Twenty minutes later, however, it begins to disperse and we can see the frozen sea below. High clouds hide the sun from time to time. Observations taken at 11:45 p. m. give: altitude, 2,500 feet; temperature, 12 degrees above zero.

We are getting nearer and nearer the Pole. The moment so anxiously awaited is almost at hand. That minute for which I have dreamed and labored months and months is imminent. I feel impatient,



Photograph from Wide World

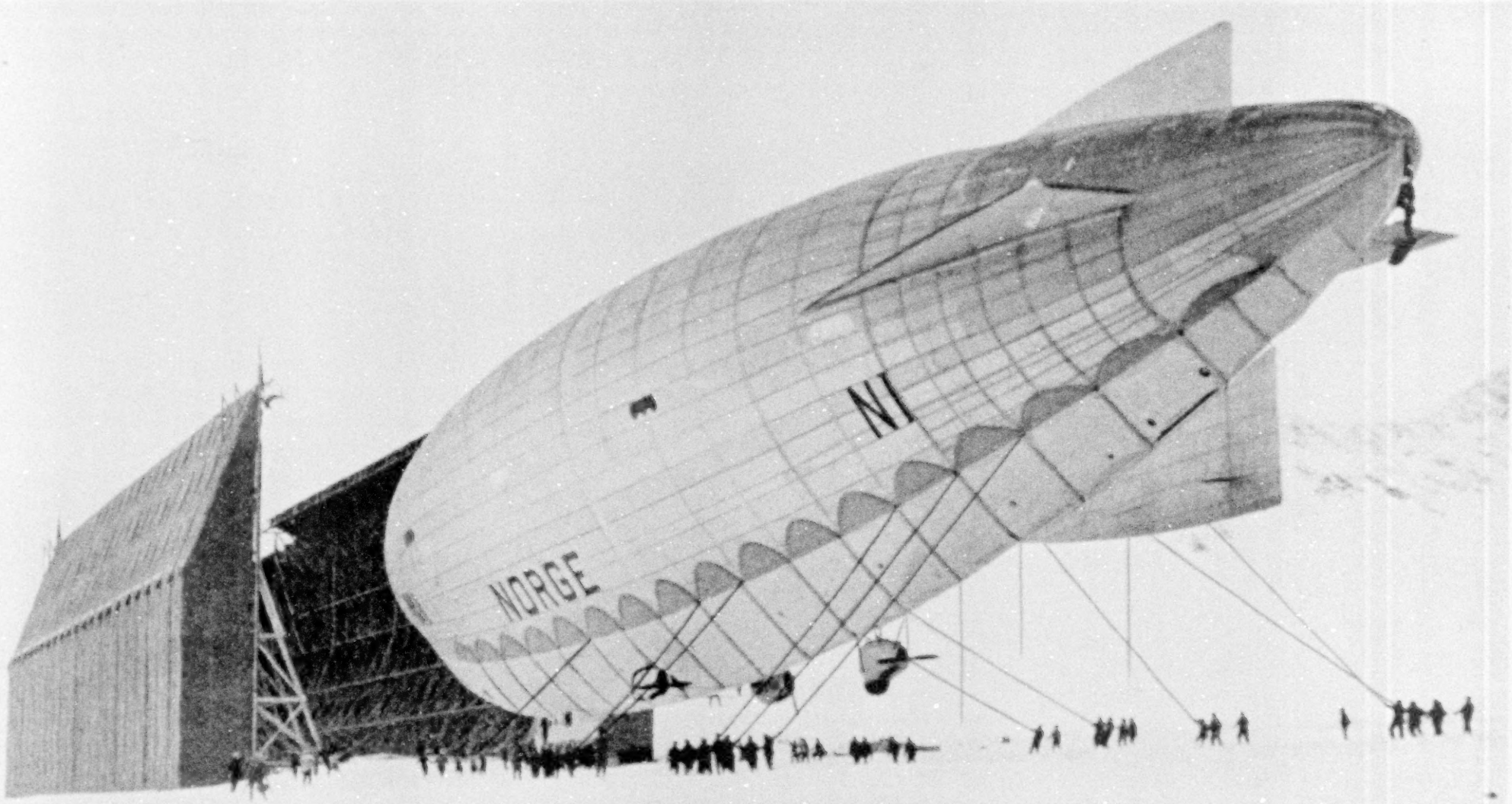
GROUND MANEUVERS

Spitsbergen is one of the few corners of the world where tourist and explorer are likely to meet. There are parts of the interior of the islands that are still little known, while the novelty of having an "Arctic holiday" within a few hundred miles of the North Pole attracts a considerable number of tourists. Before the World War both German and Norwegian passenger boats maintained regular schedules to Spitsbergen.

Photograph from Wide World

A TUG OF WAR WITH A DIRIGIBLE

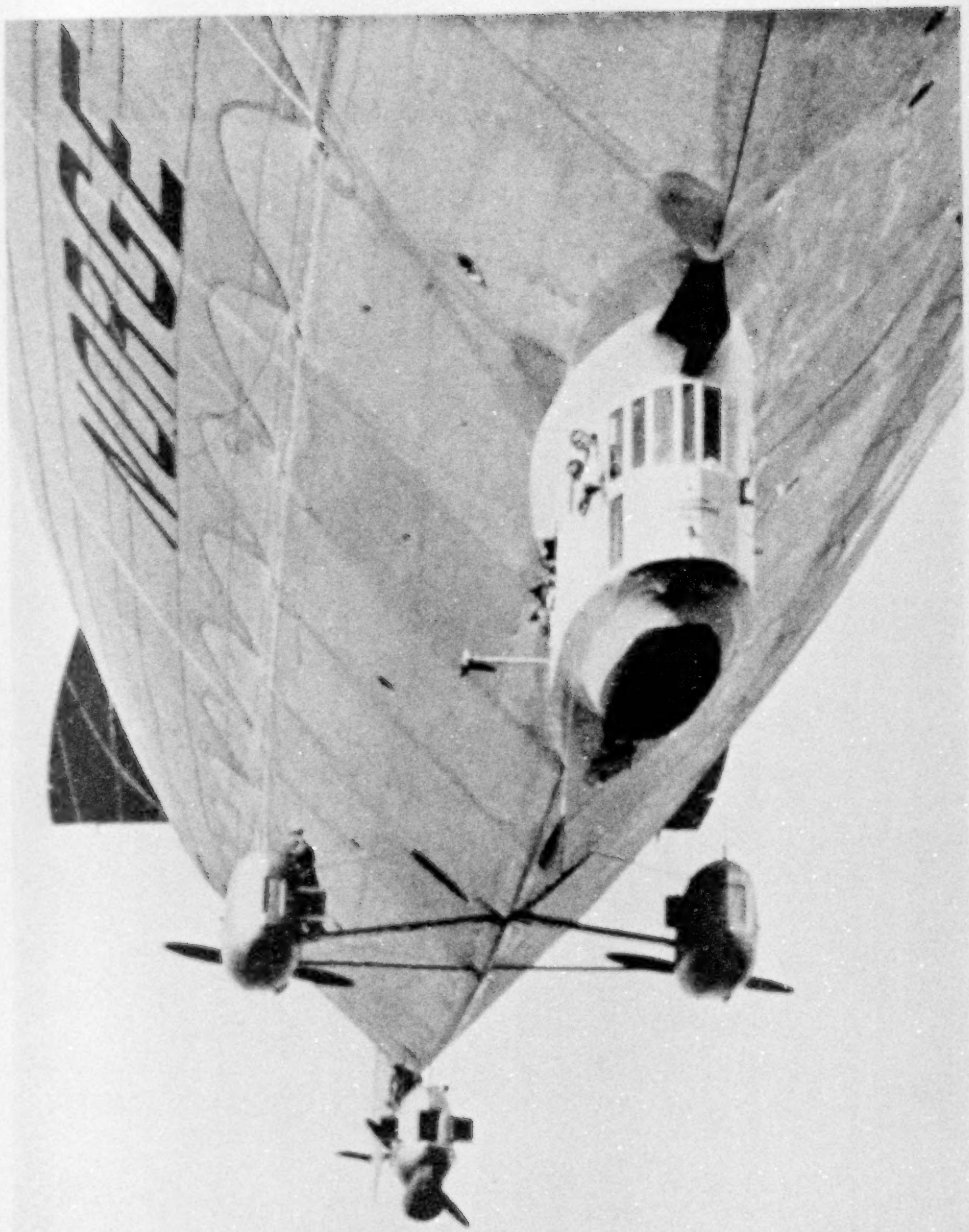
The ground crew which met the *Norge* at Spitsbergen had other duties than just that of seeing the ship safely landed. Theirs was the task of loading the dirigible with seven tons of gasoline, more than 800 pounds of oil, and the 1,100 pounds of chocolate, pemmican, coffee, crackers, etc., which constituted the provisions for the crew for the flight over the North Pole to Alaska (see text, page 196).



Photograph from Wide World

THE "NORGE" BEING PULLED INTO HER HANGAR AT SPITSBERGEN

Getting a dirigible into its hangar is not always as simple a matter as it might seem. If a stiff breeze is blowing, there is plenty of excitement attached to maneuvering the large gas bag. The *Norge* had a capacity of 650,000 cubic feet, with a length of 348 feet, but she had perfect weather for landing at Spitsbergen.



© Pacific and Atlantic

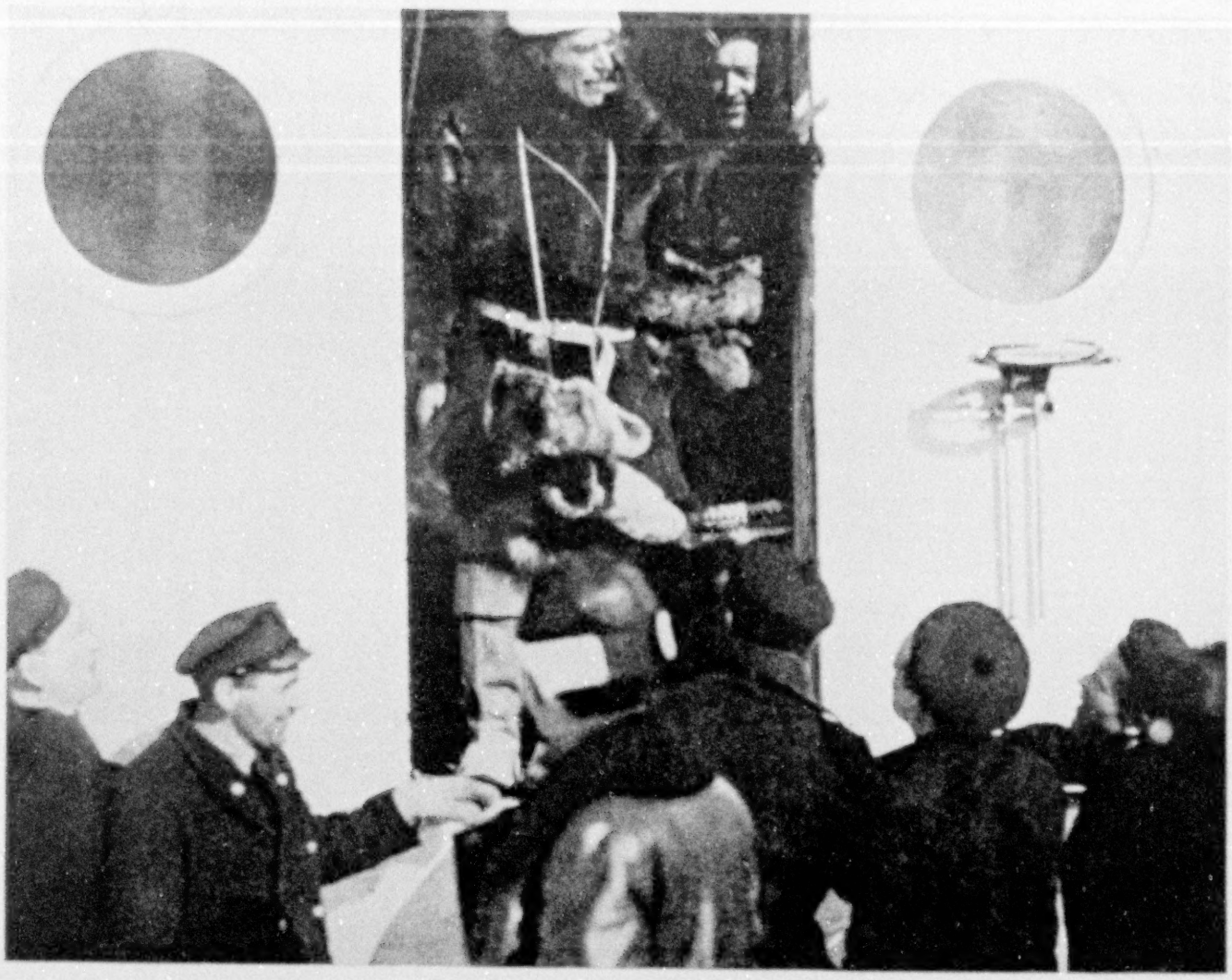
THE CABIN OF THE "NORGE" SEEN FROM BELOW

The commander, his associate officers, the ruddermen, the radio operator, and the meteorologist have their places inside this forward appendage to the big ship.

Photograph from General Umberto Nobile

TAKING OBSERVATIONS OF THE WIND AT KINGS BAY

The direction and velocity of the upper air currents are learned by observing with the theodolite the motions of a released balloon, as in the case of those shown on page 195.



Photograph from General Umberto Nobile

THE DESIGNER AND NAVIGATOR OF THE "NORGE"

General Nobile, wearing a white cap, is standing in the doorway of the airship's cabin, bidding good-bye to those of his countrymen who, perforce, remained at Kings Bay.

rather restless. An immense joy which I am hardly able to restrain is swelling my heart. I call Alessandrini and direct him to open the casket, to unfold our flag, and to fasten it to the spear which had been prepared with so much love by the Italians at Kings Bay. Alessandrini joyfully sets himself to his task.

We are drawing nearer and nearer. According to our calculations, we will be at the Pole in a few minutes. Impatiently I call to Alessandrini to hurry. Finally the flag is ready.

THREE FLAGS RELEASED AT THE POLE

At exactly 1:30 a. m., May 12, the sun's altitude shows that we have reached 90 degrees.

We are there at last!

I bring the *Norge* down to less than 700 feet and order the motors slowed down.

Amundsen is the first to throw his flag, the Norwegian; then Ellsworth releases the Stars and Stripes. Then it is my turn. I unfurl the Italian ensign from the window. The wind swells it and makes it palpitate in my hands as if it were a living thing. I let it go. It glides down along the ship's side and catches in the drift gauger. I run to free it. It drops first all in a bundle, like a shapeless mass; then it unfurls and spreads to its full length, as it reaches the ground. I follow it with my eyes. It is a large, battered flag, the same one that for two years flew in Italian skies from the stern of our ship. We had jealously treasured it in the casket given to us by Premier Mussolini in order that it might wave again, here at the Pole (see page 208).

OFF INTO THE UNKNOWN

To join the tricolor of Italy, I drop the amaranth flag of Rome, then the parchment of the Royal Geographical Society, the ensign of the Aëro Club, the banneret of our workingmen, and, finally, the ban-

Photograph from Wide World

"GOOD LUCK! GODSPEED!"

Commander Richard E. Byrd, who had only two days previously returned to Spitsbergen from his conquest of the North Pole by airplane (see, also, page 215), says good-bye to one of the officers of the *Norge* and wishes him an equally safe voyage to the Pole and beyond.

neret given to me by the Fascisti of the small town Grotte di Castro.

Once more the motors resume their normal speed. We are advancing into the unexplored region. I send greetings by radio to Premier Mussolini.

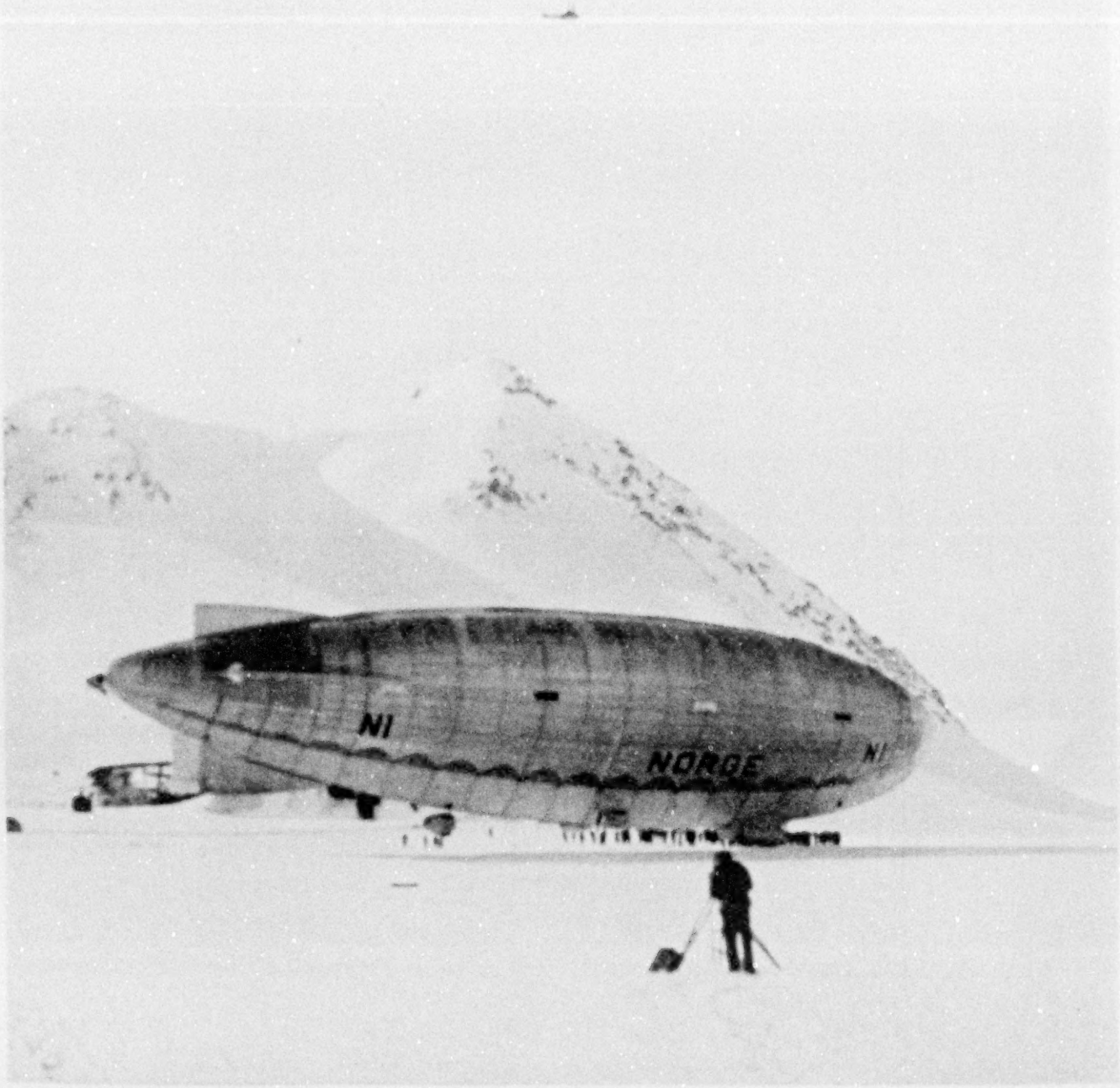
The fog has lifted and the sky, overcast with clouds, allows only an occasional fleeting glimpse of a cold and colorless sun. The whole world presents a peculiar aspect to our eyes. Here and there on the endless ice field irregular masses of a light bluish hue stand forth, assuming the shapes of snow dams or of trenches dug by the wind.

Over this monotonous landscape, unrelieved by sight of land or living creature, the navigation continues until 9 o'clock of the following morning, when fog once more envelops the airship.

THE SHADOW OF THE "NORGE" GLIDES OVER A SEA OF COTTON WOOL

This time the impenetrable blanket of mist lasts for hours and hours, with only rare intervals when it breaks sufficiently to allow us to see the frozen sea. It extends to a height of 3,000 feet or more. We are navigating above it. The sun projects the shadow of our ship on that sea of cotton wool. It seems as if some nature god of this awesome region is trying to hide the inaccessible zone from the curiosity of these adventurous men who have dared to fathom its secret, guarded inviolate for thousands and thousands of years.

During this harrowing period of our voyage ice forms very rapidly upon all parts of the *Norge*, which is constantly being subjected to fog baths. The airship with all these ice appendages presents a most extraordinary aspect and, notwithstanding the danger, one can but admire its beauty. The cables, the sun-compass, and many of the other instruments are shrouded with frozen moisture and icicles hang from all the projections of the small boats, along the radiators, and along the gangway. Ice even coats



© Pacific and Atlantic

READY FOR THE TAKE-OFF FROM KINGS BAY

On the morning of May 11, 1926, the *Norge*, with 16 men aboard, left Spitsbergen for a nonstop flight to Alaska via the North Pole. For some distance she was escorted by Commander Byrd in the huge monoplane with which he had on May 9 been the first man to fly to the North Pole. His plane may be seen directly above the *Norge*.

the propellers. Our ship seems dressed for some fantastic flight.

From time to time, under the pressure of the wind, the ice detaches itself and some pieces, striking against the propellers, are hurled against the outer covering of the ship's body, threatening to rend it.

Each such blow is announced by an ominous explosive report. At first it seems as if the noise is coming from the propeller of the radio apparatus, but we soon discover the real cause. The first rent in the outer cover occurs at 2 o'clock in the afternoon; the last of any consequence occurs between 3 and 4 o'clock the next morning.

In the meantime we are compelled to descend, as the fog rises higher and higher, and it is impossible to stay above it. We remain for a considerable time enveloped in mist punctuated now and again by sharp snow flurries. We drop to 1,000 feet and at last are able to see

Photograph from General Umberto Nobile

LOOKING DOWN ON THE POLAR ICE PACK

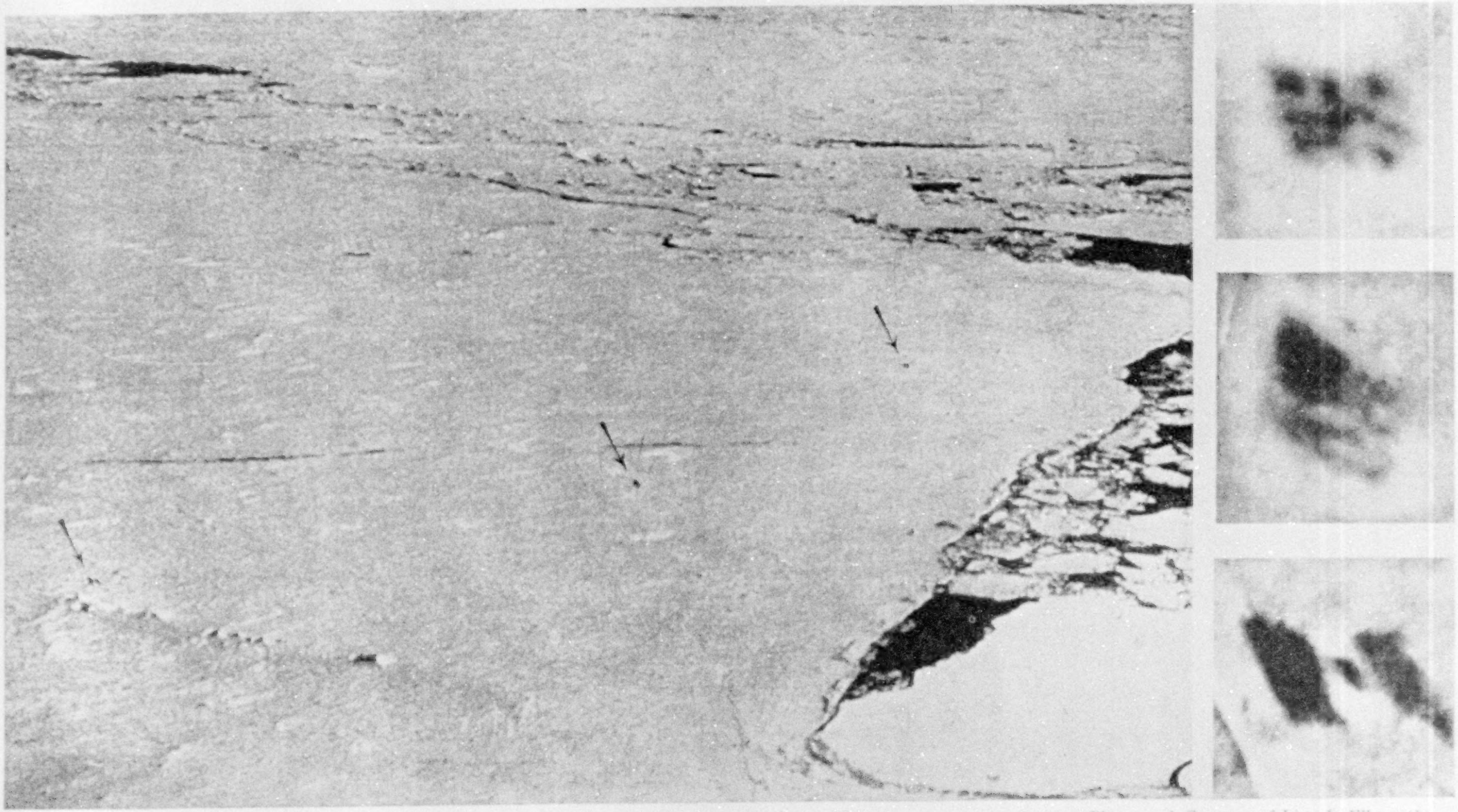
For more than 400 years the top of the world has been a lure that has attracted men of all nations. Most of that time Great Britain's flag was waving nearest the North Pole, but its actual attainment remained for the American, Robert E. Peary, on April 6, 1909. Since then no one has attempted to repeat his journey over the ice, but first Commander Byrd and his pilot, Floyd Bennett, and then the Amundsen-Ellsworth-Nobile Expedition in the *Norge* have succeeded in flying over the Pole.

the frozen sea again. From that moment until the coast of Alaska is reached, we proceed beneath the banks of fog, at an altitude of between 700 and 1,000 feet.

LAND! LAND!

The second day of navigation is a time of terrific nervous strain, for I realize that if any sharp pieces of the incrusted ice hurled at the ship by the propellers should puncture the gas chamber, causing loss of hydrogen in such large quantities as to force a landing at a great distance from the coast, there would be hardly a chance of a safe return, especially for my compatriots, who are not trained to long marches on ice.

So when, at last, the officer on watch cries, "Land!" I am overwhelmed with joy. I realize as never before what must



Photograph Courtesy of Lincoln Ellsworth

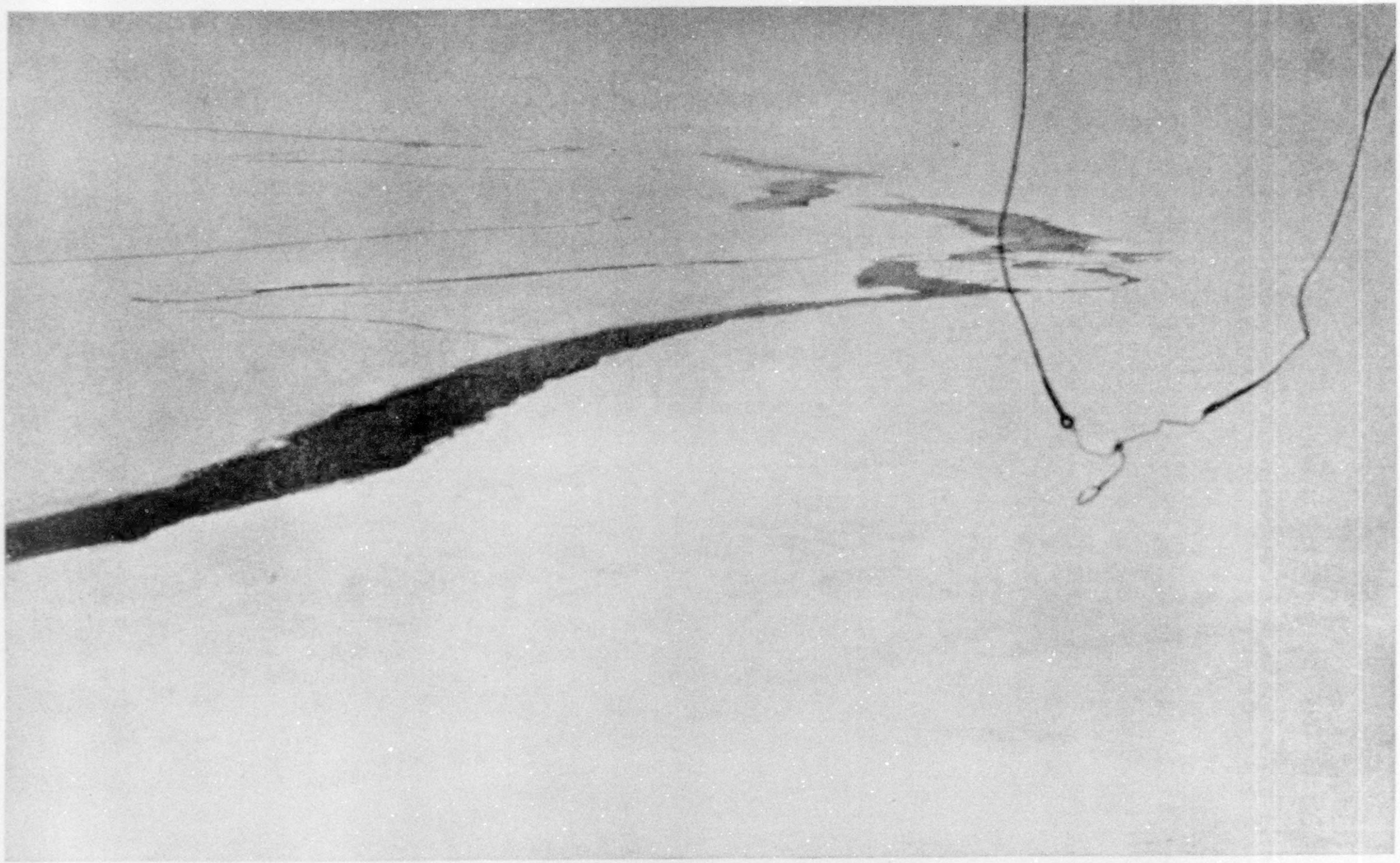
THREE BANNERS WAVE AT "FARTHEST NORTH"

The flags of Norway (right), the United States (center), and Italy (left), may be seen on the drifting ice at the North Pole. They were dropped by Amundsen, Ellsworth, and Nobile in order, as the *Norge* flew over the crest of the world (see text, page 204). At the right may be seen enlargements of the three banners, from top to bottom, respectively, Norwegian, American, and Italian. The American flag which was used for this occasion was sent to Mr. Ellsworth by President Coolidge.

Photograph from General Umberto Nobile

A RIFT IN THE POLAR SEA

Admiral Peary, first man to attain the North Pole, considered such openings, or leads, the most perilous hazard he experienced. They are caused by wind and tide pressure against the ice and are sometimes mere cracks, sometimes lagoonlike lanes, and occasionally virtual rivers of open water as much as two miles wide and stretching away far out of sight in either direction (see, also, illustration, page 210).



Photograph from General Umberto Nobile

A LANE OF OPEN WATER IN THE VICINITY OF THE POLE: NOTE THE ROPES DANGLING FROM THE "NORGE"

Leads are an ever-present nightmare to the Arctic traveler, often opening without warning immediately ahead of him. To proceed, it is sometimes necessary to make a long, hard journey to one side or the other until some place is found that may be bridged by a sledge. Occasionally, in the case of a wide lead, a large cake of ice is used as a ferryboat (see, also, illustration, page 209).

have been the feelings of Columbus and his men when they heard that long-awaited cry nearly four and a half centuries ago.

The land looming up before the eyes of the tired crew is the coast of America.

I lean out of the cabin. A cold, piercing wind strikes me in the face, causing a pleasing sensation. Ahead, on the right, we see in outline a row of grayish hills. Half an hour later we cross a narrow zone of free water separating the pack ice from the coast ice, and at 7:35 a. m. we finally reach the coast. We could not be sure of this except for the appearance of the ice—a solid mass, compact, without cracks, so different from the sea ice—cut across by a rocky strip with black and white effects.

THE FIRST ESKIMOS ARE SIGHTED

Now we veer to the right and follow the coast. No trace of life and no distinguishing landmarks are to be observed. We decide to proceed until we find some Eskimo hamlet on Bering Strait.

At 8:20 a. m. we see our first Eskimos; they look at us in astonishment. What are they saying about the flying monster coming from the inaccessible and inimical North and passing with a strange whir over their heads? I know that on our arrival at Teller an Eskimo boy, the son of a seal hunter, ran to his father, shouting, "Father, take your gun and shoot her." He believed that the *Norge* was an immense flying seal. Others, however, thought that the airship was a whale; and the old Eskimos believed it to be the devil himself.

At 8:40 a. m. we recognize Wainwright, consisting of a reindeer training field, a group of shacks, a small house with a red roof. We have cut the Alaskan coast about 6 miles south of latitude 71, between longitude 157 and 158 west of Greenwich, nearly halfway between Point Barrow and Wainwright.

The nervous strain was over at last. If we had wished, we could have effected a landing then and there and announced to the world that the Polar crossing was happily accomplished and our goal reached; but we were so elated by success now that we no longer felt fatigue. Cecioni and his motor mechanics had been awake and on their feet for two days and two nights, and were ready to proceed. Moreover, had we landed at Wainwright it would have been impossible to get back to civilization before the end of October.

We would proceed to Nome, the farthest goal of our aspirations!

Having accomplished the 2,100-mile flight from Spitsbergen over the Pole and across the hitherto-unpenetrated Polar Sea lying between Alaska and the apex of the world, the remaining 620 miles seemed a mere trifle.

I must refrain from describing in detail this last day of our flight. It had moments so full of dramatic pathos that even now, when I recall them, I shudder.

When we reached Bering Strait we encountered a vast area of low barometric pressure, but we were not aware of it because our radio apparatus had been out of order for the last 30 hours.

JOCKEYING WITH FATE AND THE ELEMENTS

The strong northeast breeze which began to blow while we were approaching the Strait held great promise for us, encouraging us to believe that we might be able to go even beyond Nome. And then came fog—grim, relentless, invincible! Hour after hour it enveloped us, shutting out all sight of the ground.

We knew that we were floating over dangerous terrain, and the height of the hills was a matter of guesswork, for our maps of Alaska were inadequate for our detailed needs.

The log book on which I jotted down my impressions reads at a certain point:

> 10:15 a. m.—We are going through a very dense fog. Nothing can be seen. I have the motors slowed down and we rise to 4,000 feet. Then I proceed with one motor at 1,000 revolutions and the other two with less speed. Visibility could not be worse. Slowing down again. A short time afterward. . . .

Here my notes stop abruptly. From that moment on, my time was taken up with problems of navigating the *Norge*, jockeying with Fate and the elements for the safety of crew and ship.

I do not remember what particular occurrence interrupted my notes so abruptly, but it was probably at that moment that I had to handle the elevator wheel to save

Photograph from International

DISMANTLING THE "NORGE" AT TELLER, ALASKA

The airship as she looked in process of being taken apart after the successful flight of 8,500 miles.

the ship from collision with a mountain.

Our battle with the fog lasted for hours on end, and we began to fear that ice might again incrust the hull of the ship.

At last, when we were able to descend beneath the obscuring blanket, a very difficult feat of navigation began, demanding all my physical and mental resources, already overtaxed by 76 hours of activities with only an hour or two of respite.

We were now over the ice of the Asiatic coast; then over the rough and foaming open waters of Bering Strait; then ice again, and finally the coveted coast of Alaska.

While over the coast near Kivalina we again lost our route and proceeded near the ground, over uneven land and among high mountains; time and again only a miracle saved us from crashing.

At last, at 2:30 a. m. May 14, we descried the Serpentine River. The route to Nome had been found. Following the coast at a low altitude, under the fog, it seemed that we could easily reach our destination if no untoward occurrence should intervene.

I was on the verge of complete physical exhaustion. I had stopped making notes in my diary at 10:15 a. m. the day before. Since then I had stood 16 hours of constant nerve-racking watch. I yielded at last, and for the first time since leaving Spitsbergen sat down in the only armchair on the ship.

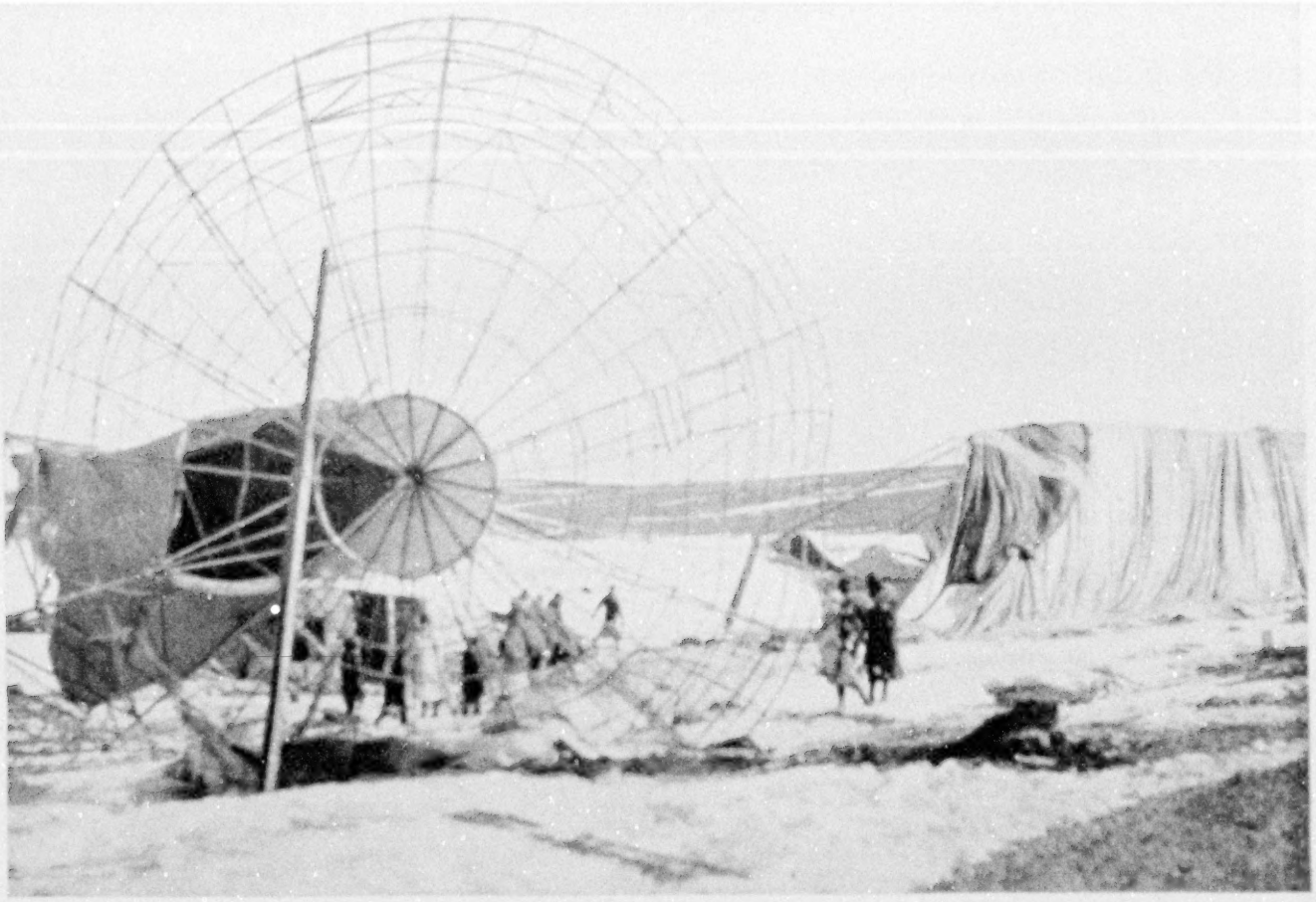
THE "NORGE" BATTLES WITH A TEMPEST

I fell into a state of physical coma, but my mind was still greatly disturbed by the uncertainty of events. After a few minutes, Larsen called to me: "We are near. In half an hour we should be over Nome."

It was about 4:30 a. m. when I left the armchair with the nauseated feeling which follows insufficient rest. It was cold. I went to the fore part of the cabin and leaned out. Under us, the sea—somber, rough, foaming; above, the sky—ashy gray, striped with black clouds coming from the north; from time to time a snow-squall. The ship was being furiously buffeted by gusts of wind.

I called to Alessandrini:

"Prepare the landing ropes."



Photograph from International

THE STERN OF THE SHIP

It was not practicable to fly the *Norge* from Alaska back to Italy, so she was dismembered where she had landed, packed in crates, and sent to Seattle as soon as the icebound Alaskan settlement of Teller could be reached by a freighter.

While these orders were being executed I considered the difficulties of landing. We were expected at Nome, as a telegram had been sent from Kings Bay to that town to have everything in readiness for our arrival; but, with such a strong wind and with an inexperienced ground crew, the maneuvering would be full of dangers.

A PICTURE OF DESOLATION

We were drawing near to the coast. The open sea ended and the ice began. Running along a dismal, grayish shore, bordered by dreary hills, we crossed a frozen creek. A few black spots (shacks) appeared, and, to complete the picture of desolation, an abandoned three-masted steamer lay on her side in the middle of the ice.

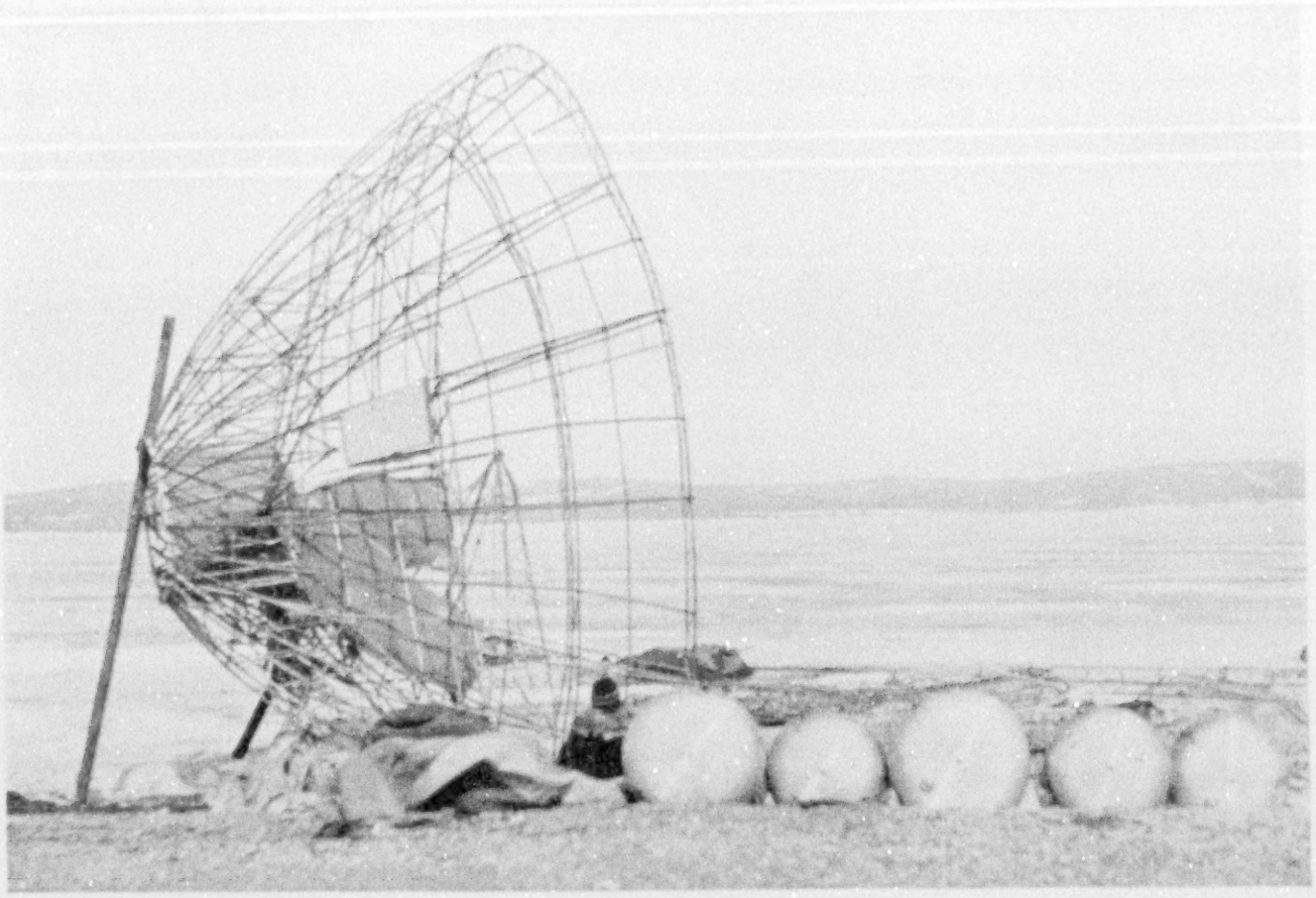
Wisting was at the steering wheel, with Captain Amundsen standing at his side. We tried to proceed over a frozen lagoon separated from the sea by a narrow strip of land, but it was soon seen that with such a wind it would be impossible to pass through the hills along the river. We veered to the right. Yonder, a few miles away, we could discern some houses. I tried to get there, running all three motors at 1,200 revolutions, but, notwithstanding these desperate efforts, we were advancing at a snail's pace.

The weather grew rapidly worse; the sky was black. While crossing the coast near a hill, the ship pitched on the bow and tilted at an angle of thirty degrees. Apparently Nome was still far away.

With the crew completely exhausted, to continue our run in the face of such a tempest seemed to me the acme of madness. Cecioni and our motor mechanics had been working for four days at a stretch. It was nothing short of a miracle that they could still stand on their feet.

THE GRAVITY OF A DECISION

It was a dramatic moment. A delay of half an hour in coming to a decision might spell disaster, the tragical end to our achievement. I deemed it imperative to land immediately, before the tempest should force the ship out of control.



Photograph from International

THE NOSE "BONES" AND SOME OF THE GASOLINE TANKS OF THE DISMANTLED "NORGE"

Teller, Alaska, where the ship landed after completing the journey across the Pole from Spitsbergen, is a reindeer station 60 miles in an air line north of Nome. A few small houses constitute the whole of this settlement on the very fringe of civilization, but it was a welcome sight to the weary and wind-tossed explorers.

Thus we came to earth on the ice near Teller, an Eskimo hamlet of 55 inhabitants.

We landed in a regular manner, with the means provided in Rome for just such an emergency—a shock-absorbing bag and an anchor. Never was a landing preceded by more agonizing anxiety, nor one more happily effected. Close to the ground the storm appeared miraculously to abate.

Both men and ship were absolutely unharmed.

In three days and three nights we had covered 3,300 land miles, and yet we had still sufficient gasoline to fly an additional 900 miles.

It seemed as if the sky, angry at our audacity, had raised its tempest to prevent us from going farther; but the earth—the good, solid earth—seemed to welcome us.

Who can imagine my feelings when I, the last of sixteen, stepped out of the ship upon the land of Alaska?

But there was no time for sentiment. The tempest seemed to have granted us but a short truce. The *Norge* must be deflated and dismantled.

IT IS ALL OVER

The order was given. The gas bag began to wave, to collapse. Gradually it sank into a shapeless mass. The commander's cabin was dragged under. The engine boats disappeared under the empty rubberized fabric. It was the end.

Other members of the expedition quickly sought rest in the houses of the near-by village, but Alessandrini and I remained a little longer to gaze at our beloved ship.

She had brought us from the other side of the world, through the perils of tempests and snows, over the waste places of the great unknown region, that vast blind spot on the map of the world. She had obeyed our every command and met

all tests valiantly. She had been made fast to mooring masts, she who loved the liberty of the sky, and had courageously defied the storms in France, in Russia, and in Bering Sea; yet not one single part of her elastic frame had given way. She had defied wind, snow, cold, rain, and fog. Now she lay motionless and helpless on the white snow field.

Only one who had seen that airship come into existence and had lived for 176 hours in her cabin, from Rome to the North Pole, from the Pole to Alaska; only one who had accustomed oneself to consider her as a living thing, could realize how heartless it seemed that it was I who had struck her down, at the triumphant close of her wonderful trip. What bitterness in the cup of joy of our triumph!

Thus ended our stupendous adventure.

THE POLE'S SURRENDER TO MAN

It is interesting to review the history of North Polar explorations in the last 30 years. In the first line of attack have been the Italians, the Americans, and the Norwegians.

In 1893-96 Nansen reached 86° 14′ north; a few years later, in 1900, the Italians, led by the Duke of the Abruzzi, pushing farther, touched 86° 34′. The exploration contest by means of sledges was continued and brought to a victorious end by Peary, the American, who, in 1909, finally reached the Pole.

Later on, when man turned to aërial means to conquer the Arctic secret, we again find Norwegians, Americans, and Italians cordially competing in scientific effort.

Amundsen, in 1925, flies as far as 87° 44′ for Norway; one year later, Byrd, the American, on daring wing, reaches the Pole, and only 48 hours later, our airship retraces the path of the American and also attains the Pole.

And this time the ship designed, built, and prepared in Italy and commanded by an Italian officer was carrying on board all three together—the flags of America, Italy, and Norway. And after having dropped them down at the North Pole, on the threshold of the immense unexplored region, our airship was the first to cross the Polar Sea, reaching the Pacific.

If Italy to-day is proud that her ship and her men have accomplished the first transpolar flight; if we are proud to have bound Italy and America together with an amazing aërial route, the plaudits of the civilized world should also go to Amundsen, the Norwegian, who gave his name and the benefit of his vast Arctic experience to the undertaking; to his modest and capable associate, Lincoln Ellsworth, the American, and to all those who coöperated in the technical and financial organization of the expedition. We of the Italian contingent are especially proud that it was Premier Benito Mussolini who fostered the undertaking and gave for it the ship and the men to command her.

After centuries, the dream of old Italian navigators to reach the Pacific across the north, starting from the Mediterranean, is at last realized. This is why we Italians are very grateful to Norway, that small but glorious country, which with her initiative gave us the opportunity to bind Italy and America together with a most amazing aërial route.

We are happy and proud that all along this aërial route of 8,500 miles across Europe, the Barents Sea, the Polar Sea, the Bering Sea, and Alaska, we carried on the front of our commander's cabin the "fascio littorio," symbol of the old, eternal Rome and of the new Italy.

INDEX FOR JANUARY-JUNE, 1927, VOLUME READY

Index for Volume XLI (January-June, 1927,) of the National Geographic Magazine will be mailed to members upon request.

STALKING THE DRAGON LIZARD ON THE ISLAND OF KOMODO

By W. Douglas Burden

THE following 21 photographs were taken on a scientific expedition of the American Museum of Natural History to the Lesser Sunda Islands in Malaysia. The primary object of this expedition was the quest of the dragon lizards of Komodo, the largest lizards in the world, which were first reported in 1912 by P. A. Ouwens, a Dutch scientist of Buitenzorg, Java.

As there are many interesting problems of a zoögeographic nature to be worked out in this region, general collecting of reptiles and amphibians was an important part of the program.

The Sunda Islands are volcanic, built up from the bottom of the sea by a successive series of flows. The eruptions of lava have arisen along the axis of the Sunda Fold, a great arc in the earth's crust extending for more than 3,000 miles, from Sumatra to the Philippines.

Although Bali, Komodo, and Wetar belong to a single group of islands, the extraordinary differences in the people who inhabit them and in the character of the islands themselves are striking.

In Bali, a luxuriant toyland of coconut groves and paddy fields, we found an erupting volcano, an advanced civilization, and a people remarkable for their beauty and form. From Bali we proceeded on the *S. S. Dog*, an official yacht given to us by the Dutch Colonial Government, to Komodo, the home of the dragon lizards.

Komodo was relatively unexplored, only a few white men having landed there. With its fantastic sky line, its sentinel palms, its volcanic chimneys bared to the stars, it was a fitting abode for the great saurians we had come so far to seek. Deer, wild boar, water buffalo, and game birds were abundant on the island.

THE LARGEST AND OLDEST LIVING LIZARDS

With the use of baits we attracted the giant lizards, which flocked around in considerable numbers, so that we were able to observe their habits, select those which we wanted for a museum group, and catch others alive.

The lizards, which attain a length of 10 feet and a weight of 250 pounds, are known to scientists as *Varanus komodoensis*. They are vicious, carnivorous reptiles, which attack their food much as the great flesh-eating dinosaurs must have done, ripping off great chunks of meat with their sharp, recurved saw-edged teeth and swallowing them whole, bones and all.

The Varanus lizards first appear as a genus in the early Eocene, some sixty million years ago; so that we have here not only the largest, but also the oldest, of living lizards. But Komodo is geologically recent. Thus, an old animal is found on a young island. How did it get there? Whence did it come?

A VISIT TO WETAR

After five weeks of collecting and observing, we proceeded from Komodo to Wetar, situated at the eastern limit of the Lesser Sunda chain. As it arose out of the sea, the island appeared a vast mass of torn and splintered mountains. The central portion is unexplored, and small wonder, for the tumble of jagged peaks presents insurmountable barriers opposing the traveler's way.

Bali was inhabited by Malays practicing the Hindu religion; Komodo by a few Malay convicts exported there by the Rajah of Sumbawa. Wetar, on the other hand, is inhabited by Papuans, who belong to a large group of peoples classified by anthropologists as Oceanic Negroids. The Malays, being a mixture of Mongoloid-Polynesian, have no negroid blood.

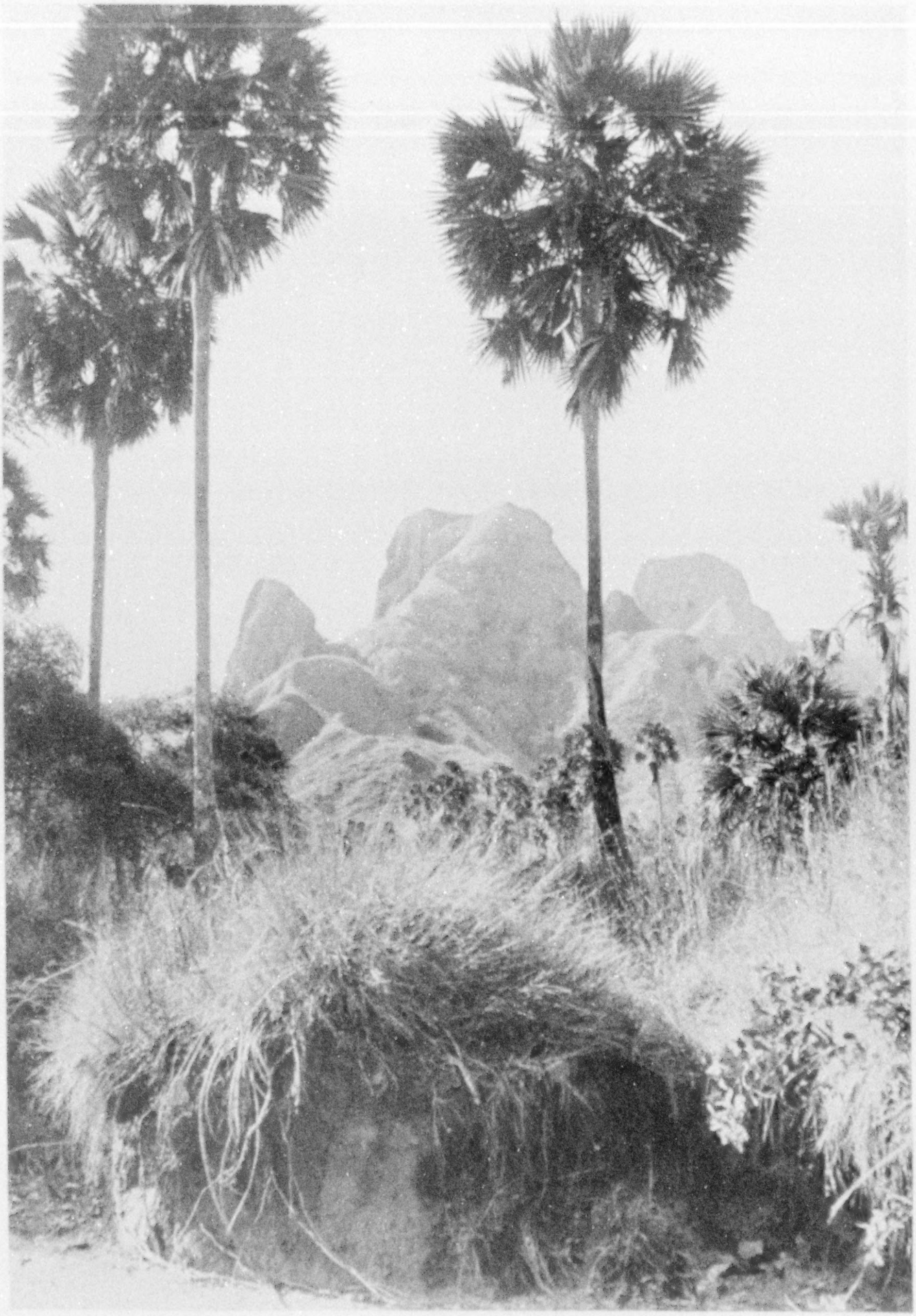
At Wetar we camped on the shore, enjoying the luxury of sleeping *à la belle étoile*. Collecting proceeded apace until finally one fine morning we sailed away into the Banda Sea, homeward bound.

We had secured a large collection of reptiles and amphibians. Of the dragon lizards we had 14 specimens, two being alive. The rest were to be used for study purposes and for a mounted group in the new Hall of Reptiles of the American Museum.

Photograph by Mrs. W. Douglas Burden

A COOLIE CLIMBS A GUBBONG, OR LONTAR PALM, ON KOMODO

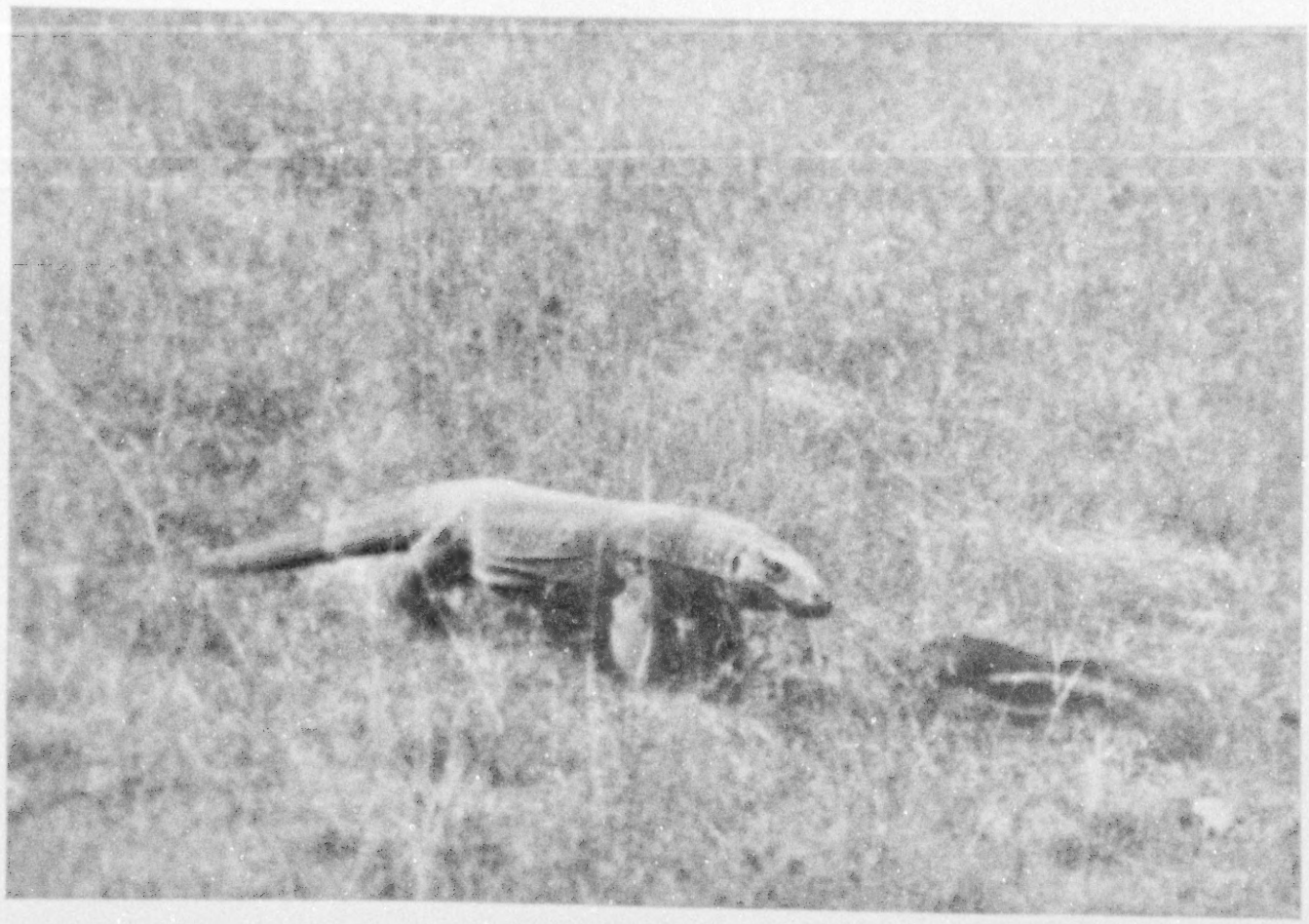
Everywhere on the island home of the dragon lizard these great trees stand like sentinels along the sky line. Below, in the distance, is Telok Sawa, where the *S. S. Dog*, of the author's scientific expedition (see opposite page), rode at anchor.



Photograph by W. Douglas Burden

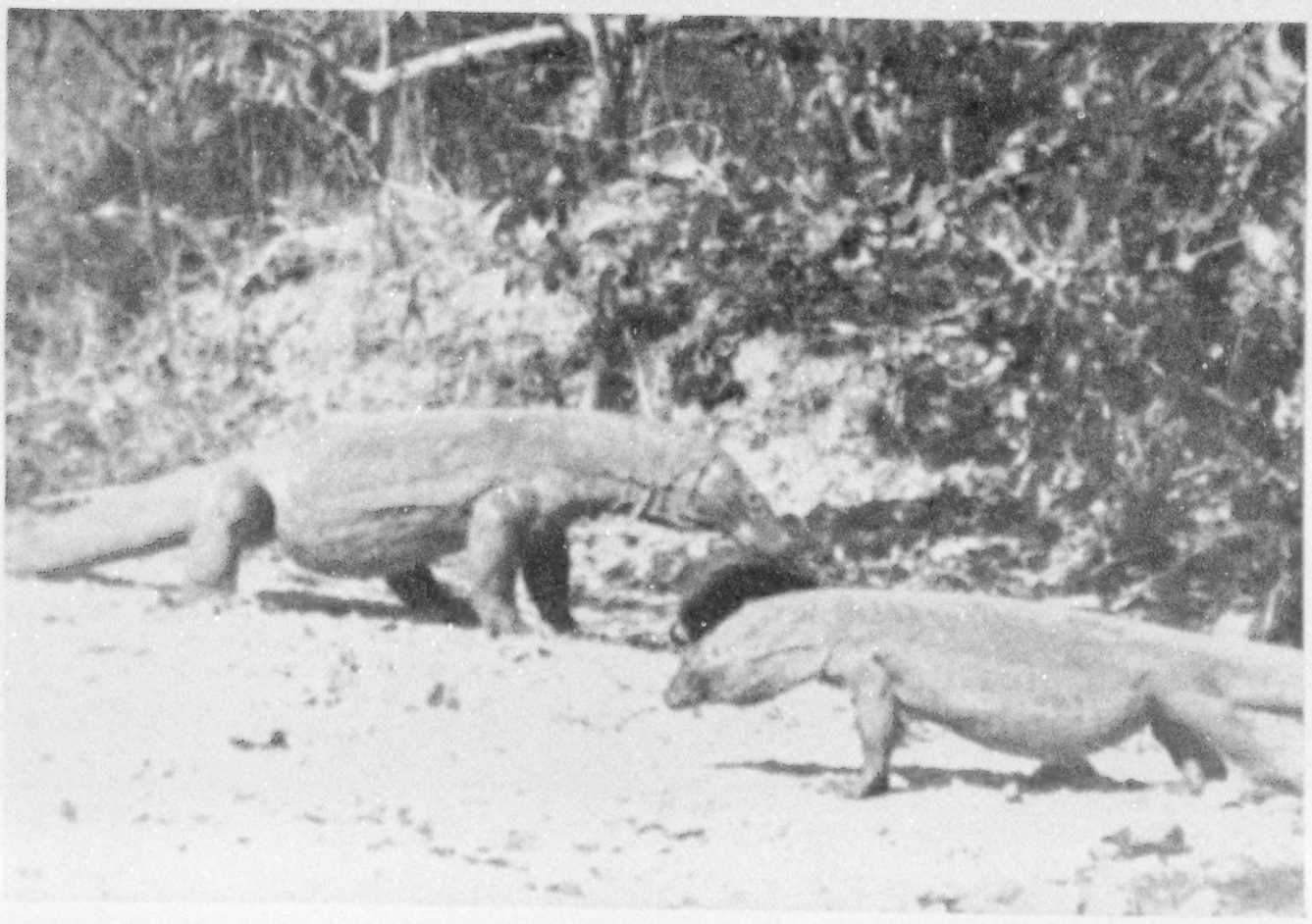
IN THE PINNACLE DISTRICT OF KOMODO

The face of the Komodo landscape belies its true character. When the traveler has forced his way in among the rugged mountains, walking and climbing become very difficult.



A GIANT LIZARD ADVANCING TOWARD THE BAIT

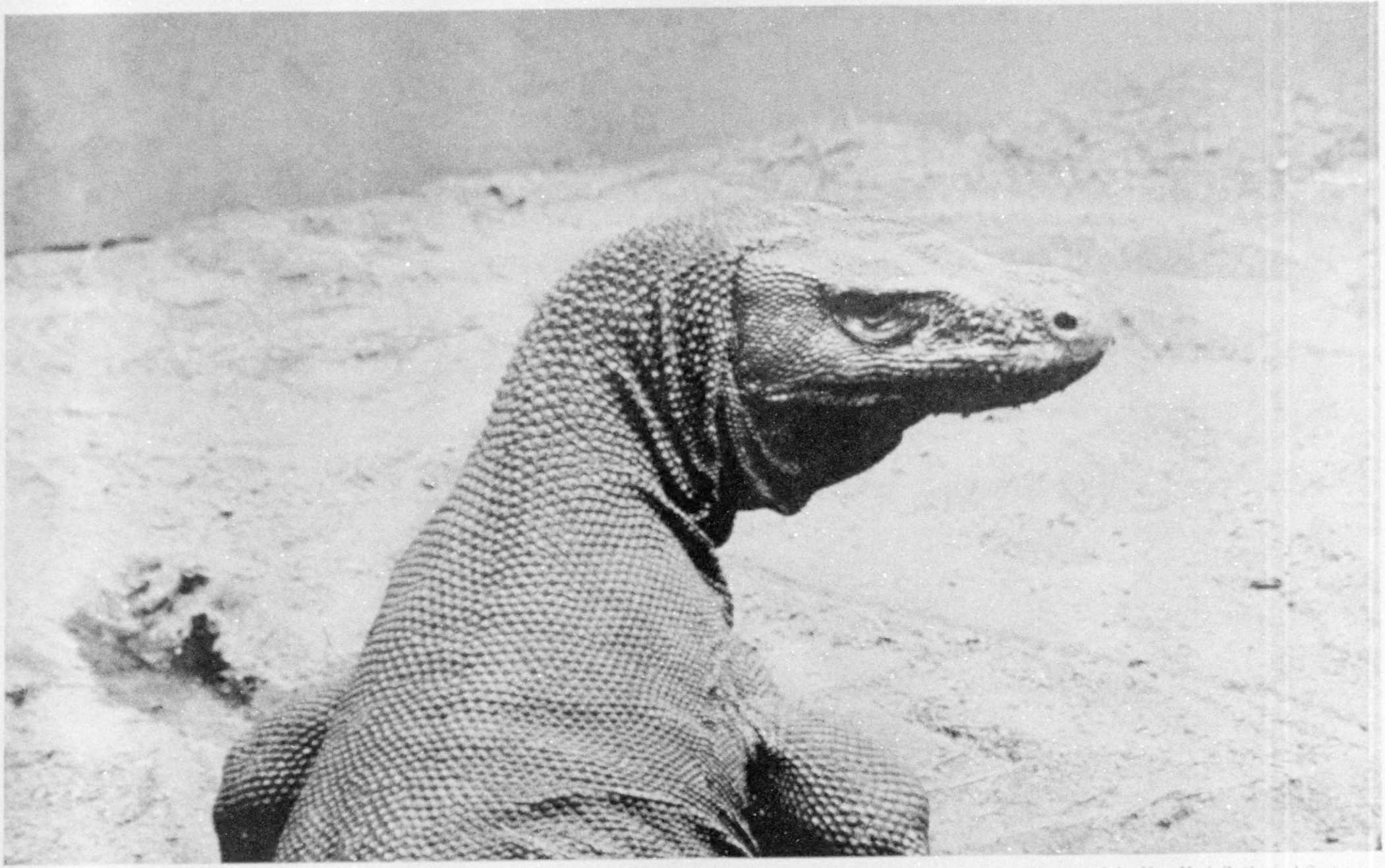
Just so have his ancestors crawled unceasingly through untold millions of years across prehistoric lands.



Photographs by W. Douglas Burden

A LARGE LIZARD ABOUT TO BEGIN FEEDING ON A WILD BOAR CARCASS

The bait's curling tail can just be distinguished in the illustration below the larger lizard's neck.



Photograph by New York Zoölogical Society

AN EXILE FROM KOMODO

One of the specimens of *Varanus komodoensis* at the New York Zoölogical Park. Unfortunately, for reasons yet unknown, the big lizards that were brought to the United States alive soon languished and died in captivity.

Photograph by Mrs. W. Douglas Burden

WHEN "VARANUS KOMODOENSIS" IS SHOT HE COLLAPSES LIKE A PRICKED BALLOON

This specimen was a fair-sized lizard, weighing about two hundred pounds.

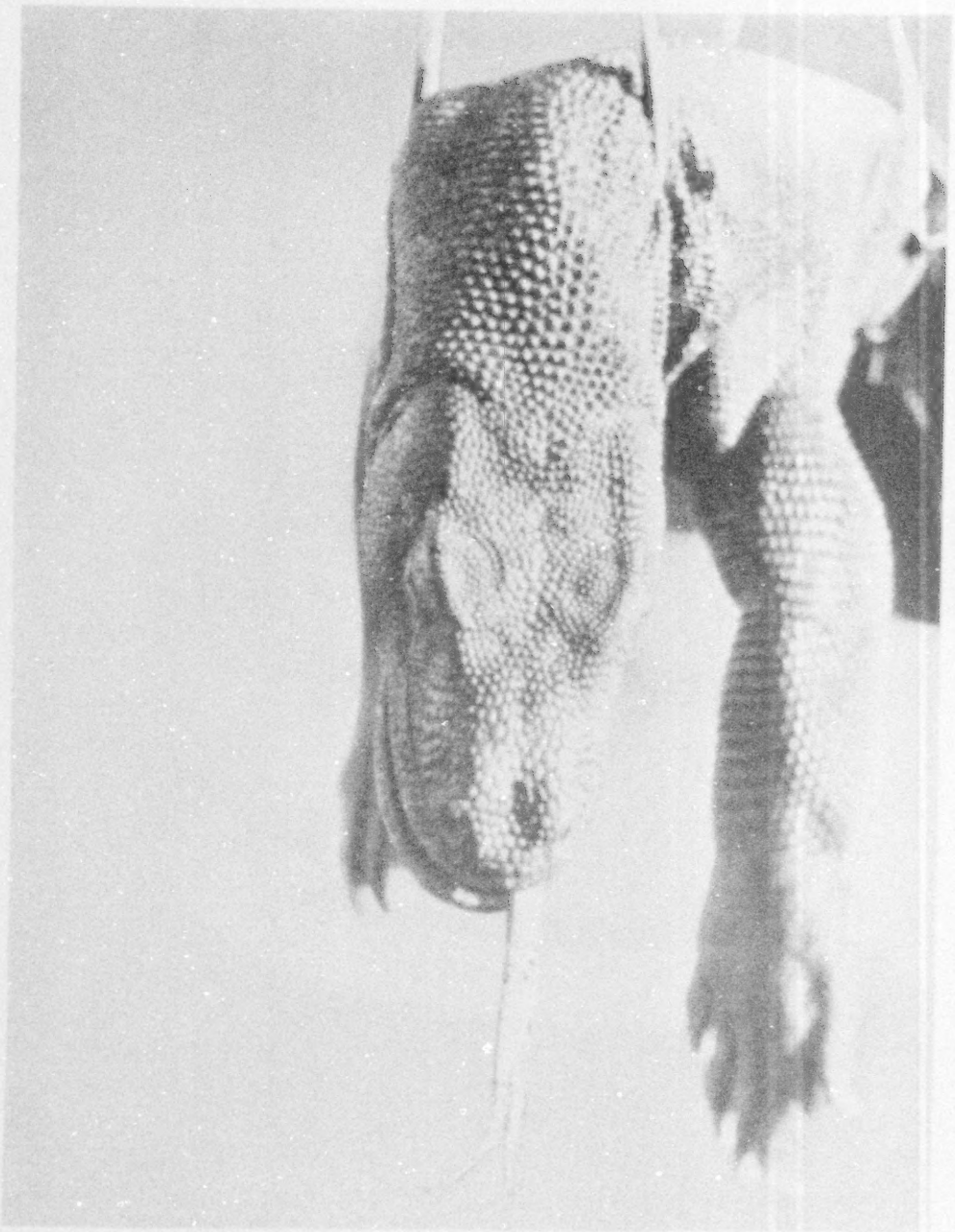
Photograph by W. Douglas Burden

THE EXPEDITION'S FIRST CAMP ON KOMODO

The hut occupied by the author and Mrs. Burden was open to the sea breeze. The roof of woven palm leaves was mellow and bearded with age, and it contained a rich assortment of crawling life, including pit vipers, scorpions, centipedes, and spiders. Indeed, a most interesting collection could have been made from this shelter. To Mrs. Burden's left is Lee Fai, the expedition's cameraman.

READY TO BE MOUNTED AS A MUSEUM SPECIMEN

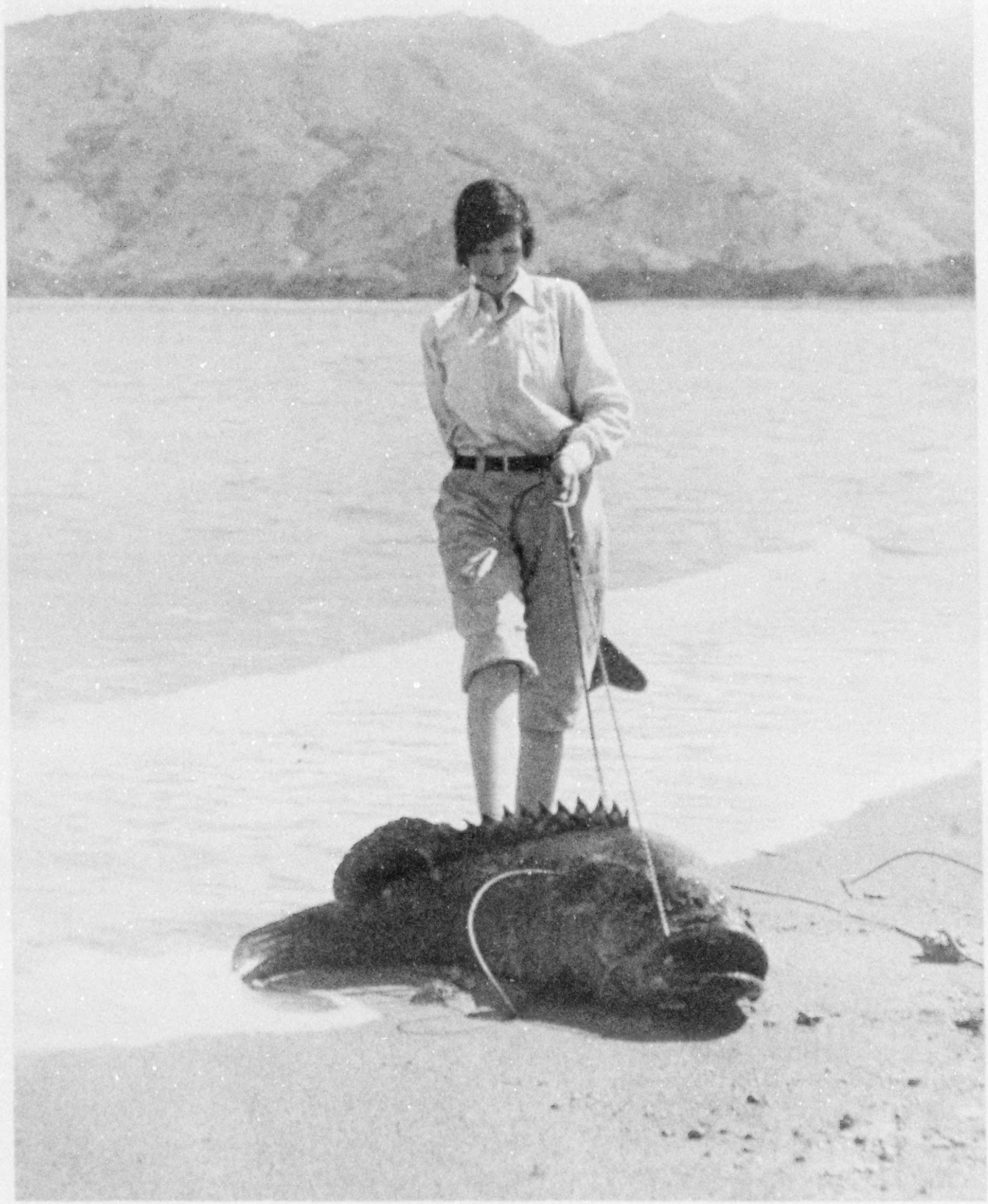
Dr. E. R. Dunn, of Smith College, herpetologist of the Expedition, is holding the skin of a small Komodo lizard.



IN LIFE ITS FORKED TONGUE IS IN ALMOST CONSTANT ACTION

Each scale is underlaid by a plate of bone affording a magnificent armor, which is, however, insufficient protection against bullets.

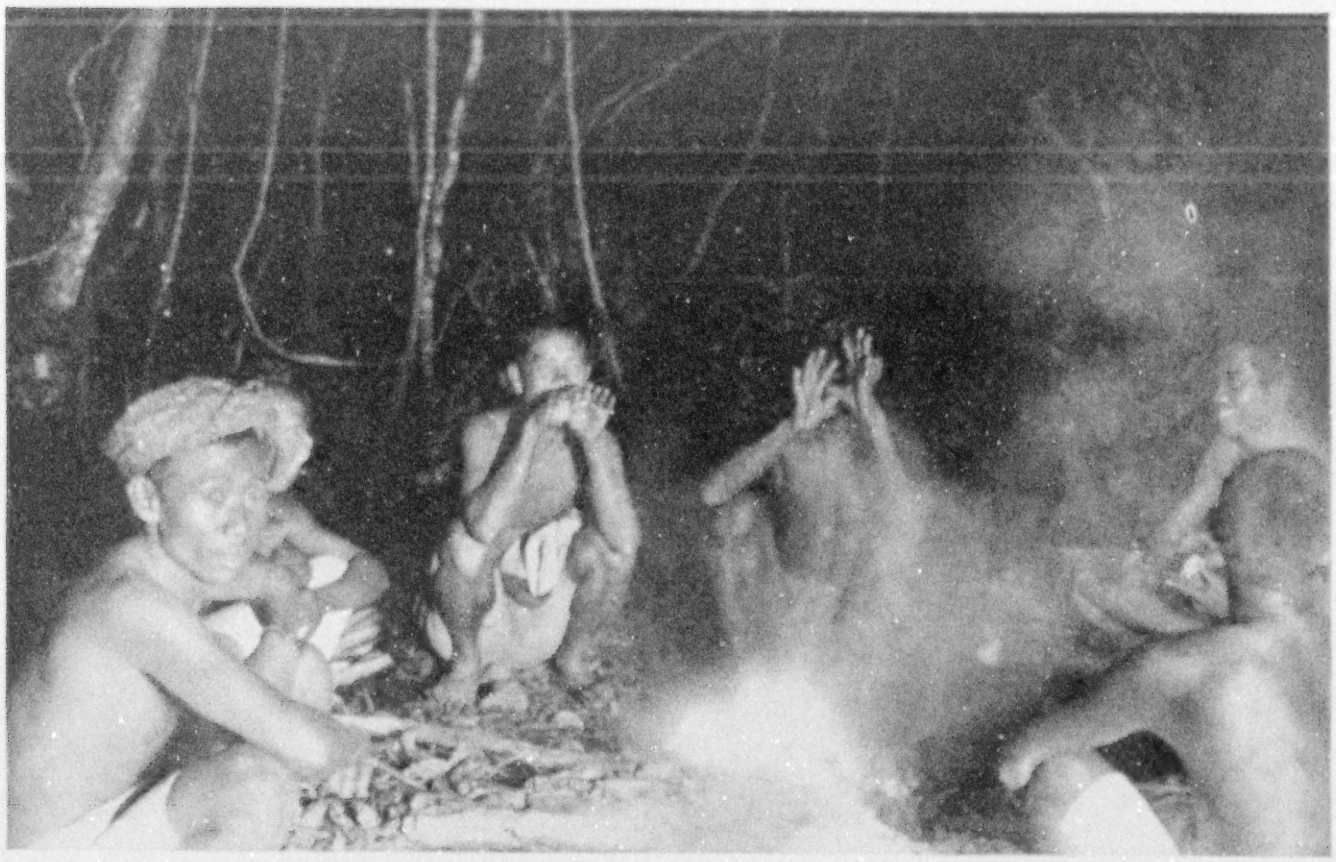
Photographs by Mrs. W. Douglas Burden



Photograph by W. Douglas Burden

THE SEA YIELDS A MONSTER

Mrs. Burden with a large grouper (*Epinephelus pantherinus*) caught off Komodo. Much of the fishing tackle was lost before manila rope and a leader of chain were adopted. This fish made very good eating.



Photograph by W. Douglas Burden

AROUND A CAMP FIRE IN THE JUNGLES OF WETAR

Photograph by Mrs. W. Douglas Burden

A GREEN PIT VIPER ON KOMODO

While resting in the grass the coolie felt something wriggling against his skin. Under a fold of his garment he found this venomous creature, *Trimeresurus gramineus*, which he extracted gingerly, with many explosive grunts; then removed its fangs.

Photograph by Mrs. W. Douglas Burden

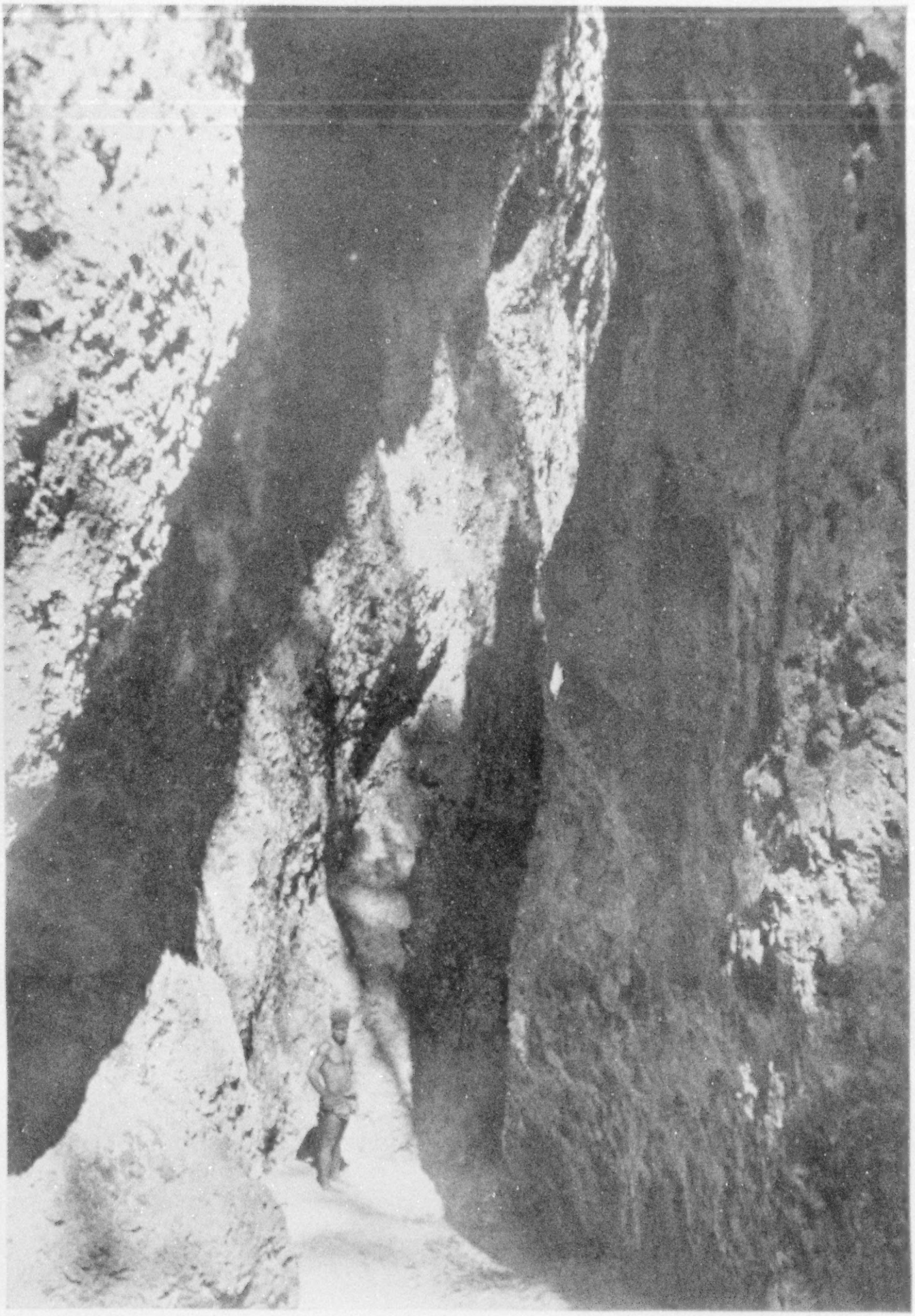
BALI IS NOTED FOR ITS ORNATE ARCHITECTURE

Temple gateways, with their characteristic graven deities, form the most pronounced architectural features of this enchanting island. Bali and Lombok are the only islands in Malaysia where the Hindu religion still holds sway.

Photograph by W. Douglas Burden

A BALINESE WOMAN COOLIE GOES TO MARKET

Beautiful highways connect the important villages of Bali. Along these thoroughfares the natives pour into the market place, which here, as elsewhere in the Orient, is the all-important center for barter.



Photograph by W. Douglas Burden

THE EXPEDITION'S PAPUAN GUIDE IN A CANYON OF WETAR

Such canyons, cut vertically out of ancient lava flows, make of the island a well-nigh impassable mass of splintered mountains.

Photograph by W. Douglas Burden

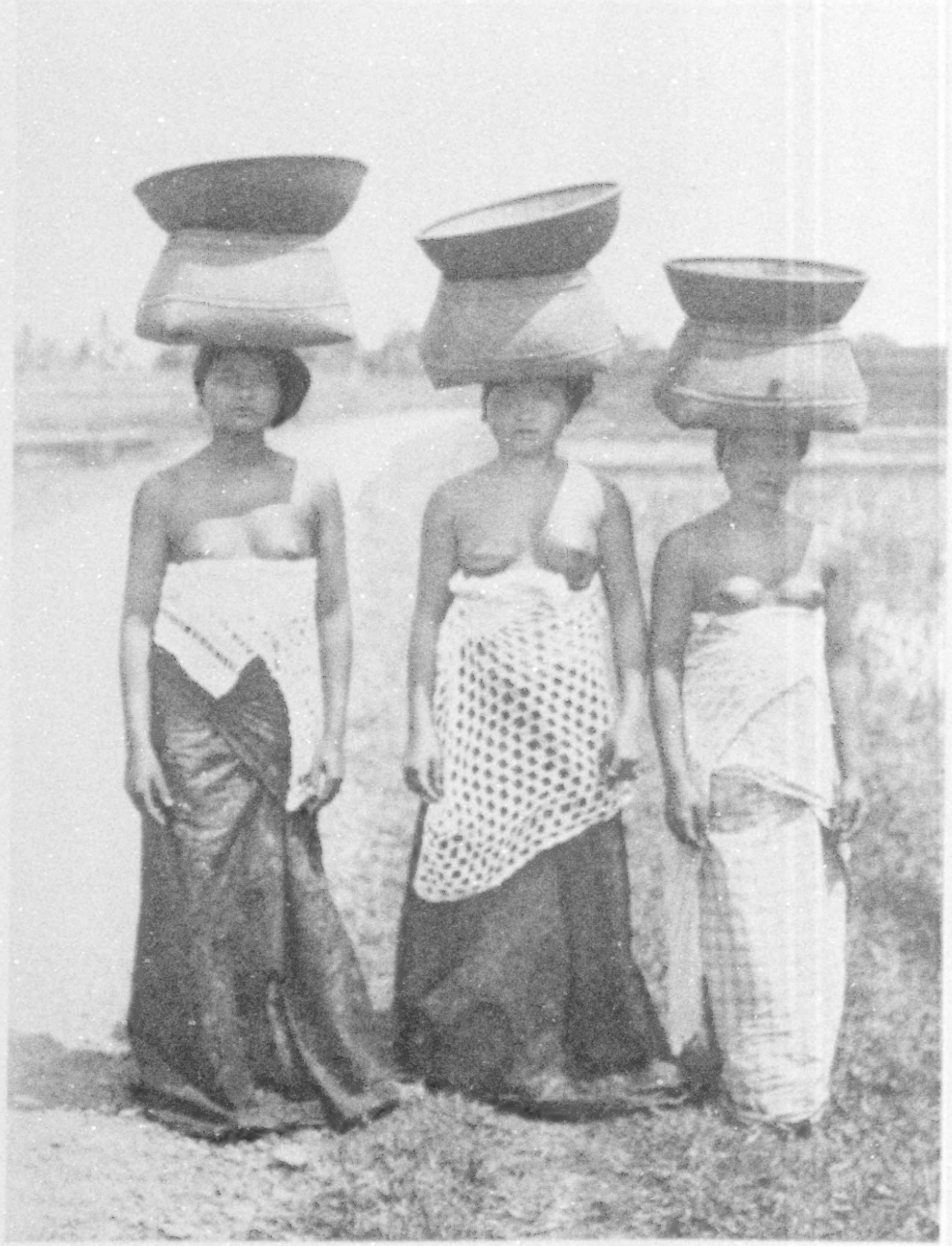
BATHING IN BALI

In the evening whole villages come down the leafy paths to watering places. Except for the inevitable sarong, Balinese ladies regard clothes as a mere encumbrance.

Photograph by Mrs. W. Douglas Burden

BALINESE DANCING GIRLS

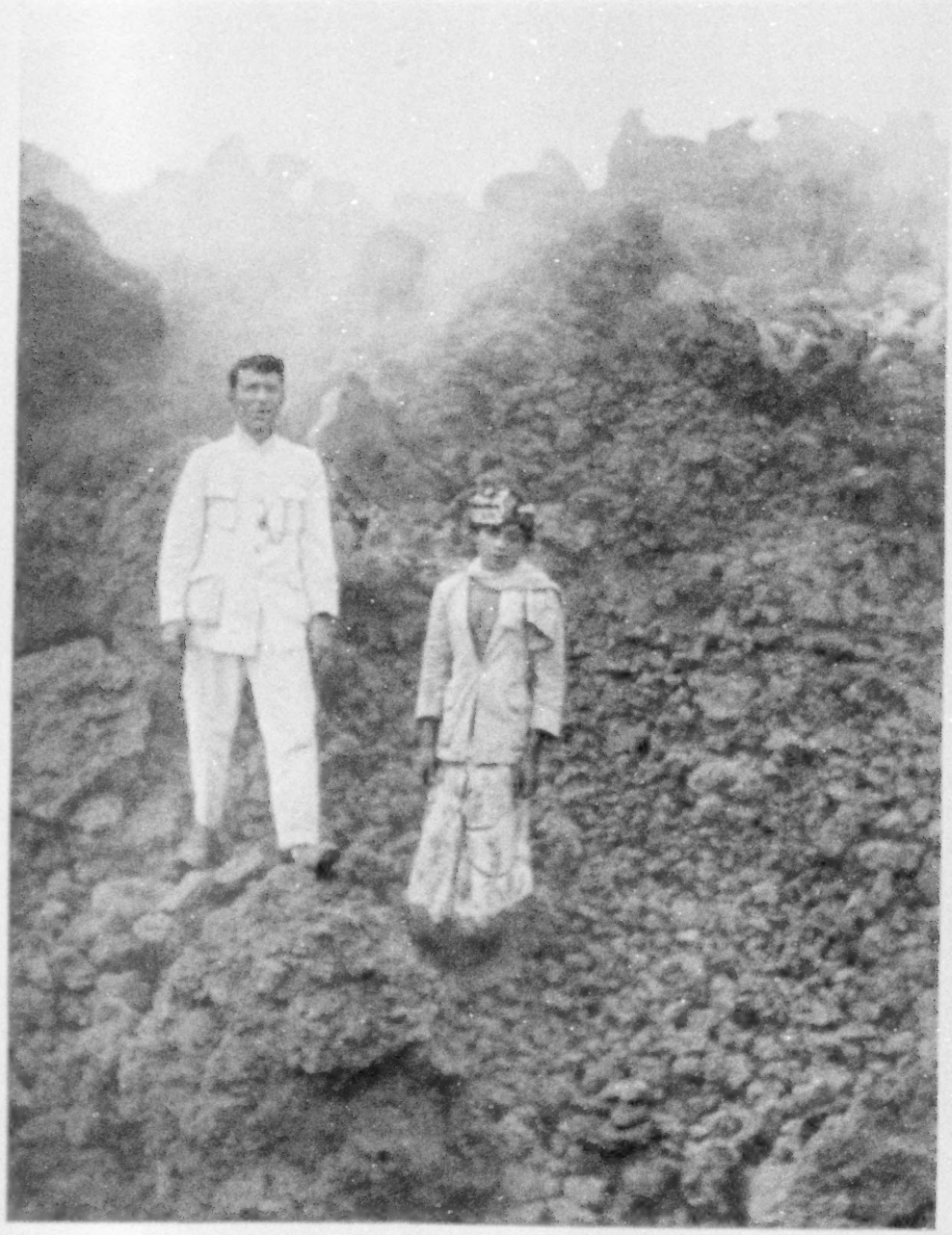
The beautiful brocaded costumes and the golden headdresses crowned with the sacred lotus flower are in striking contrast to the barren, dusty temple yards in which these lithe little dancers perform.



Photograph by W. Douglas Burden

BALINESE COOLIE WOMEN BOUND FOR THE PADDY FIELDS

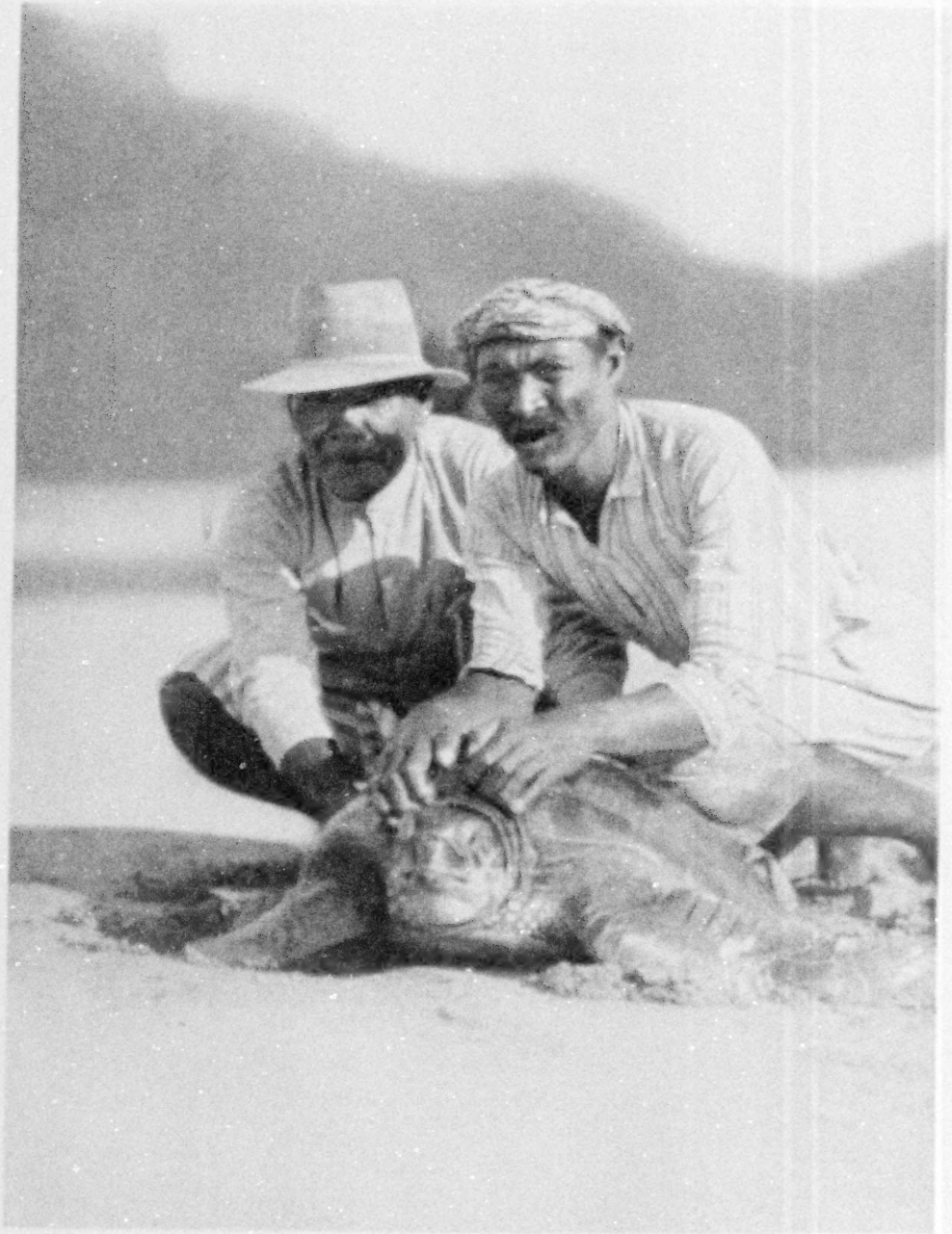
In Bali one never sees the thin, scrawny types of humanity so common in India. There is but slight variation from physical perfection. Everywhere the girls, like plump partridges, adorn the landscape.



Photograph by W. Douglas Burden

THIS LAVA FLOW ON BALI DESTROYED A VILLAGE

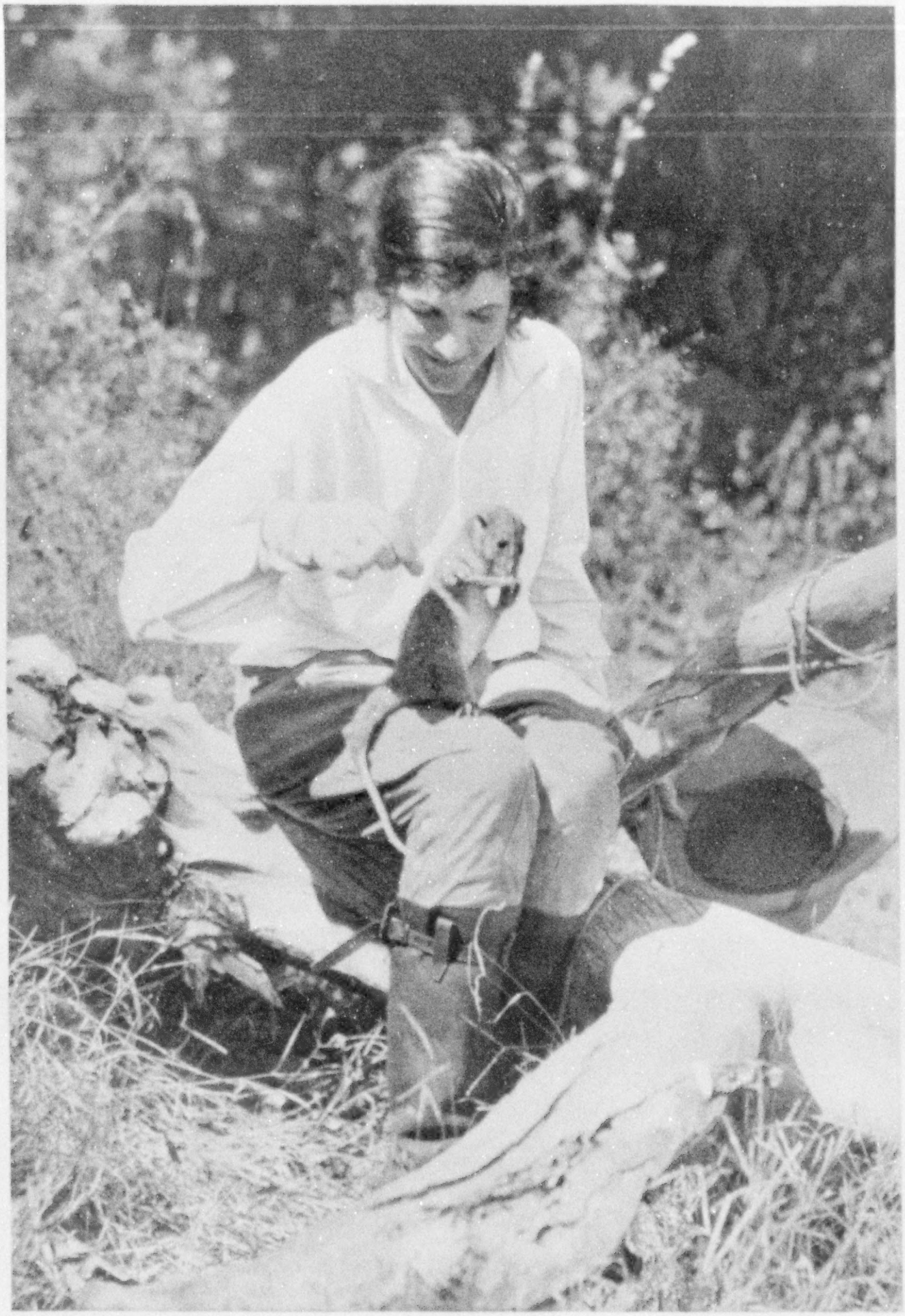
When photographed this fresh lava flow, 25 feet high, was still steaming as it rolled relentlessly forward from Batur Volcano. It annihilated the settlement of Batur on the mountain's slopes.



Photograph by Mrs. W. Douglas Burden

CAPTURED BY HAND BENEATH THE WAVES

This green turtle was caught in the sea by Malays, who dived after it, struggled with it under water, and finally emerged with shouts of glee, dragging their prize up on to the beach.



Photograph by W. Douglas Burden

FEEDING A BABY CUSCUS ON WETAR ISLAND

This arboreal, nocturnal, prehensile-tailed marsupial resembles the American opossum. Such little creatures are caught barehanded in the tree tops by the Papuans.

AIR CONQUEST

From the Early Days of Giant Kites and Birdlike Gliders, The National Geographic Society Has Aided and Encouraged the Growth of Aviation

SINCE Langley pioneered thirty-one years ago; since Alexander Graham Bell flew his man-lifting kite; since the Wright Brothers boldly rode the skies in the first crude, careening biplane, the growth and progress of air travel have been steadfastly aided and encouraged by the National Geographic Society.

In its Magazine there has been told in word and picture, year by year, the graphic, cumulative story of the Conquest of the Air.

Twenty-four years ago, during his far-reaching experiments with tetrahedral kites, Dr. Bell wrote, in an article for the NATIONAL GEOGRAPHIC MAGAZINE, "A properly constructed kite should be capable of use as a flying machine, when driven by its own propellers."* To-day we see the singular fulfillment of these prophetic phrases. Now the wings of the modern biplane are patterned closely after the "Hargrave Box Kite," from which Dr. Bell started his long, historic experiments.

In 1907 Dr. Bell built and flew the famous *Cygnet*, a kite more than 40 feet long. Working with Bell then, in his laboratories at Baddeck, Nova Scotia, were Glenn H. Curtiss, J. A. D. McCurdy, F. W. Baldwin, and a young American Army officer, Lieutenant Thomas E. Selfridge—a student of air problems. One day Selfridge climbed into the big kite and rode it up into the air as it was flown. He rose to a height of 168 feet, and then was lowered gently and safely (see, also, page 236).

FROM MAN-LIFTING KITE TO MODERN AIRPLANE

Selfridge later associated with the Wright Brothers and became one of America's pioneer aviators. He was killed in line of duty at Arlington, Virginia. Selfridge Flying Field, at Mount Clemens, Michigan, is named for him.

In its issue for January, 1908, the NATIONAL GEOGRAPHIC MAGAZINE printed an article, "Dr. Bell's Man-Lifting Kite," with 27 illustrations, describing that unique aërial vehicle. Dr. Gilbert Grosvenor, now President of The Society, was its author.

"While Dr. Bell's ultimate object," wrote Dr. Grosvenor, "is to secure a flying machine that will support itself in the air . . . the experiments with the *Cygnet* have been mainly studies in stability. . . . Dr. Bell's next step will be to put a powerful light motor on a modified form of the *Cygnet*."

SPEED PLANE IS FIRST COUSIN TO KITE

It is but twenty years since Selfridge went boldly up in Bell's kite—an unparalleled feat at that time—and remained in air seven minutes. Yet, to get up then, the big kite had to be flown with a long, stout rope, pulled by a horse or a steam launch. Now, propelled by powerful motors, planes may remain aloft forty hours or more. Yet, curiously enough, the graceful speed plane of to-day is but a first cousin to the kite—the same bulky, horse-drawn kite that Bell and Selfridge flew two short decades ago.

Pursuant to its policy of promoting aviation, The Society's annual banquet of 1911 was given "In Honor of the Army and the Wright Brothers." In The Magazine of March for that year, we read that this banquet was one of the most notable meetings in the history of The Society. Among those present were the President of the United States, William Howard Taft, and members of The Society from 37 States and many foreign countries.

Dangerous and undeveloped as aviation then was, it had already seized men's imaginations. Crude and clumsy as were the planes of 1911, they had even then definitely taken their place as implements of war. Major General Leonard Wood, speaking at this banquet, said: "All of us soldiers look upon the aëroplane as a great addition to our warlike apparatus.

*"Aërial Locomotion," by Alexander Graham Bell, in the NATIONAL GEOGRAPHIC MAGAZINE for January, 1907.

THE SOCIETY'S HIGHEST AWARD TO EXPLORERS

The coveted Hubbard Gold Medal of the National Geographic Society has been awarded only eight times, including the award to Col. Charles A. Lindbergh, in the 39 years of The Society's existence (see text, page 242).

We know that its use is going to be invaluable in future wars."

Three years later, the World War crashed upon civilization. Then, just as General Wood had predicted, the airplane at once took its place.

NATIONAL GEOGRAPHIC SOCIETY RECORDS AVIATION HISTORY

In the NATIONAL GEOGRAPHIC MAGAZINE for January, 1918, Admiral Robert E. Peary, discoverer of the North Pole, wrote an article on "The Future of the Airplane," in which he said in part:

"We are now entering upon an era of air power—a stupendous era—which in the near future will be as far superior to the greatest sea power of the present as the unlimited ocean of atmosphere now sweeping unbroken around the globe is greater than the land-bordered Atlantic or Pacific.

"Not only must America depend upon her air fleets to protect her from the attacks of hostile sea fleets, but from air raids upon her cities, for the rapid advancement in the science of aviation makes it only a question of time before we shall be vulnerable to attack from above, even though the enemy be separated from us by thousands of miles of ocean."

Year by year The Society, in sponsoring the development of aviation, has given its members a continuous, chronological record of progress in air traffic, of explorations carried on by means of aircraft, and of all great aviation feats.

Particular attention has been paid to dirigibles. As early as 1906, when Walter Wellman was preparing for his attempt to reach the North Pole by balloon, The Society coöperated and appointed Major Henry E. Hersey as its representative to take charge of scientific work on the expedition. In 1924 The Society made a grant of funds for the use of Captain Robert A. Bartlett, director of the preliminary surveys of the area north of Alaska, when the Navy considered sending the *Shenandoah* on a voyage of exploration to that region.

SIR ROSS SMITH WROTE OF EPOCHAL VOYAGE FOR THE GEOGRAPHIC

Of all the many articles and hundreds of photographs The Society has published on aviation, no story ever aroused more interest than Sir Ross Smith's colorful, stirring narrative of his amazing flight from London to Australia. This outstanding story appeared in The Magazine for March, 1921 (see, also, p. 240).

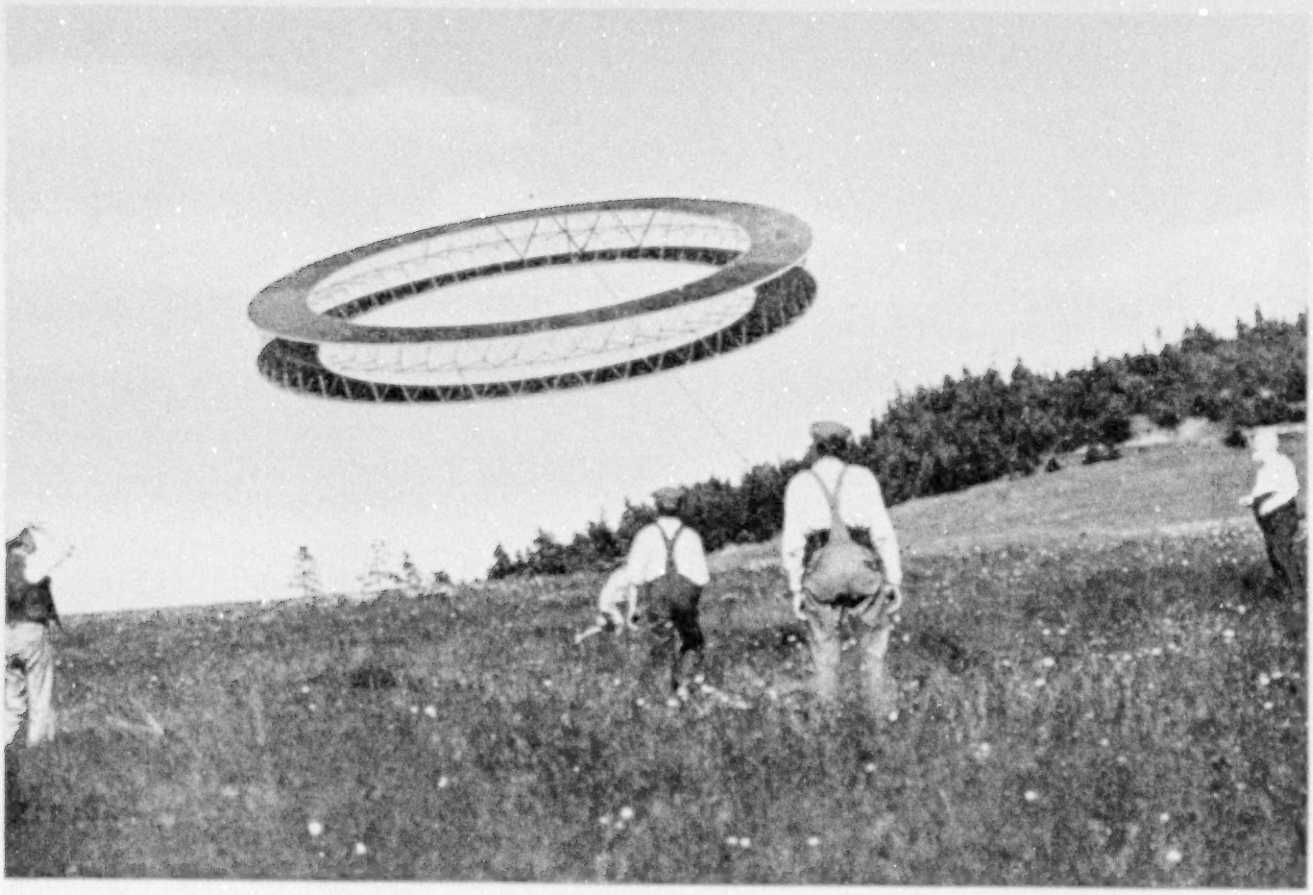
The MacMillan Arctic Expedition, which sailed in 1925, was operated under the auspices of The Society, with the United States Navy coöperating, seeking to explore the vast area north of the Beaufort Sea.

In The Magazine for November, 1925, in his story "Flying Over the Arctic," Commander Richard E. Byrd, U. S. Navy, gives a vivid description of the work of the three Navy amphibian planes with the MacMillan expedition.

Photograph by Professor Wood of Johns Hopkins University

LILIENTHAL IN HIS GLIDER, JUST BEFORE IT KILLED HIM

In this machine the inventor made many flights in Germany and the United States.



Photograph by Gilbert Grosvenor

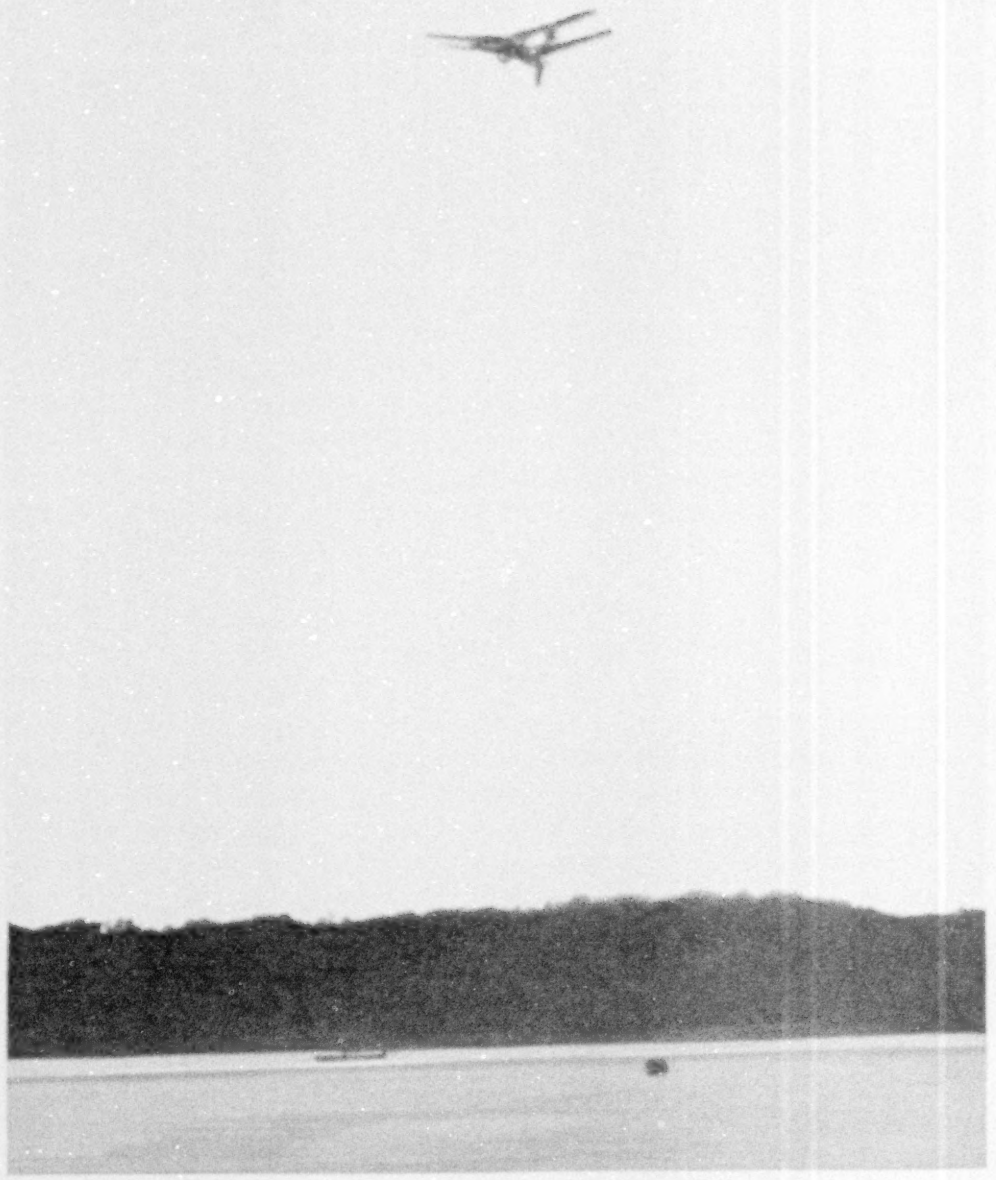
AN ODD KITE USED IN EARLY AVIATION EXPERIMENTS

In his pioneer studies of flying-machine stabilization and kindred problems, Dr. Alexander Graham Bell built and flew various types of tetrahedral and other kites. In one of his giant kites, a man once rode into the air to a height of 168 feet (see text, page 233).

Photograph by J. A. Douglas McCurdy

THIS KITE LIFTED A MAN

Built by Dr. Alexander Graham Bell in his early aviation experiments, these giant kites pulled so hard on their ropes that they were flown with the aid of a horse or a steam launch.



LANGLEY'S WINGED STEAM ENGINE ACTUALLY FLEW

On May 6, 1896, Samuel P. Langley fired up his model "aërodrome" near Quantico, Virginia, and it made a successful flight. Dr. Alexander Graham Bell, a witness of the experiment, took this photograph.

Official Photograph, U. S. Army Air Corps

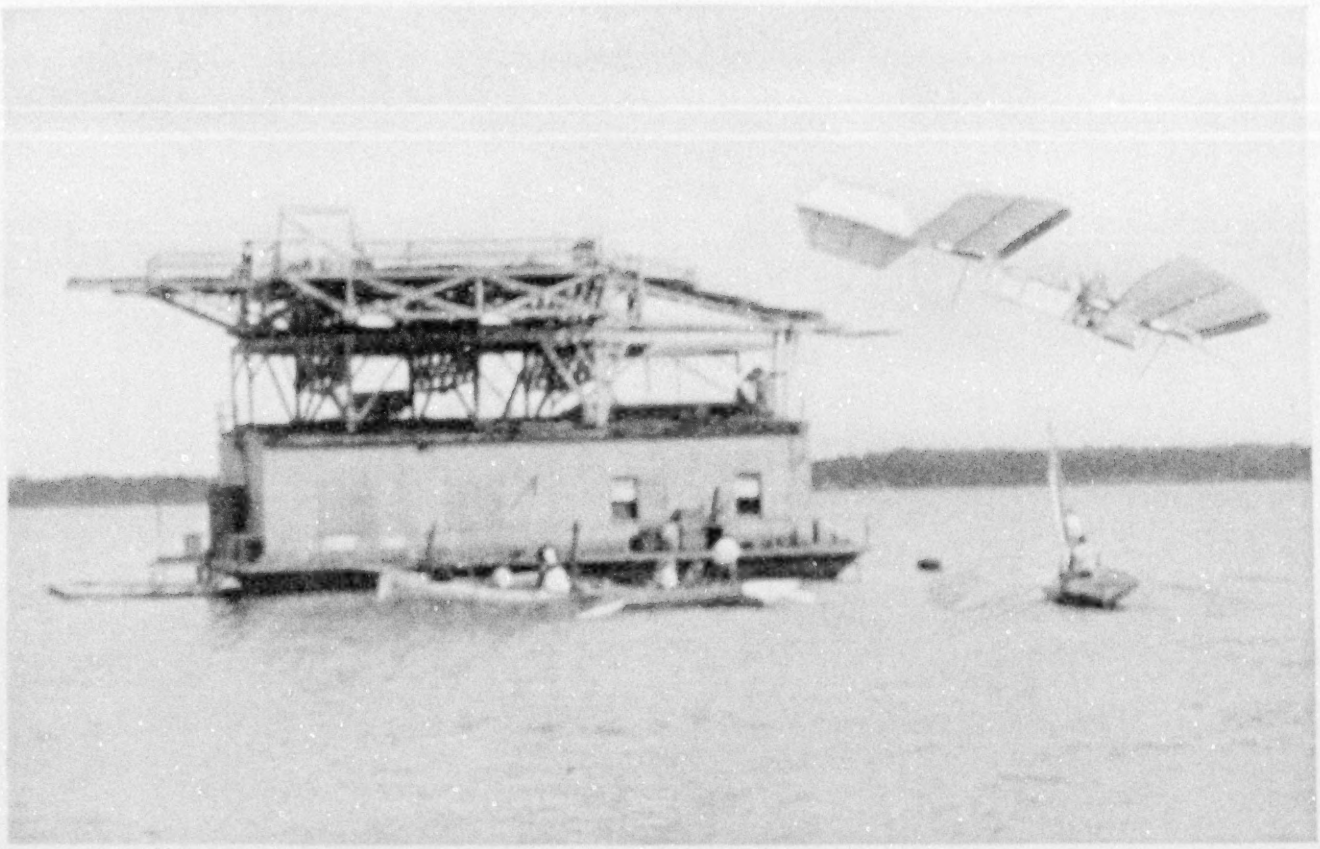
THIS WRIGHT PLANE FLEW 20 YEARS AGO

The American Government's first official study and observation of flying machines were made at Fort Myer, Virginia, across the Potomac River from Washington, D. C., when the Messrs. Wright made their pioneer demonstration flights there two decades ago.

Official Photograph, U. S. Army Air Corps

THE "T-2" ON THE FIRST NON-STOP FLIGHT ACROSS AMERICA

May 2, 1923, Lieutenants Oakley G. Kelly and John A. Macready flew from Long Island to San Diego, covering in 27 hours the same distance which—years before—it took Ezra Meeker several months to do with an ox team.



LANGLEY'S PIONEER AËRODROME FALLS INTO THE POTOMAC

This primitive plane was a reproduction of his model aërodrome, which had actually flown (see page 236). But in the attempt to launch it from the runway on top of the houseboat, it caught in the primitive launching gear and was thrown into the river. Public ridicule blocked further experiments and hastened the death of this distinguished scientist and inventor.

On this expedition practical use was made for the first time of the Bumstead sun-compass, an instrument invented by Chief Cartographer Albert H. Bumstead, of the National Geographic Society. Because of the variations of the magnetic compass and the weakness of magnetic force in the Arctic, this sun-compass was found of great value. "In clear weather the sun-compass enabled us to do accurate navigation," wrote Commander Byrd. "I consider it a great contribution to science." Months later, when the daring Byrd flew to the North Pole, accompanied by Bennett, he again used the Bumstead sun-compass, and wrote of it: "I do not hesitate to say that without it we could not have reached the Pole; it is even doubtful if we could have hit Spitsbergen on our return flight."

Later, after his epochal polar dash, an article entitled "The First Flight to the North Pole" appeared in this Magazine for September, 1926, in which Byrd wrote:

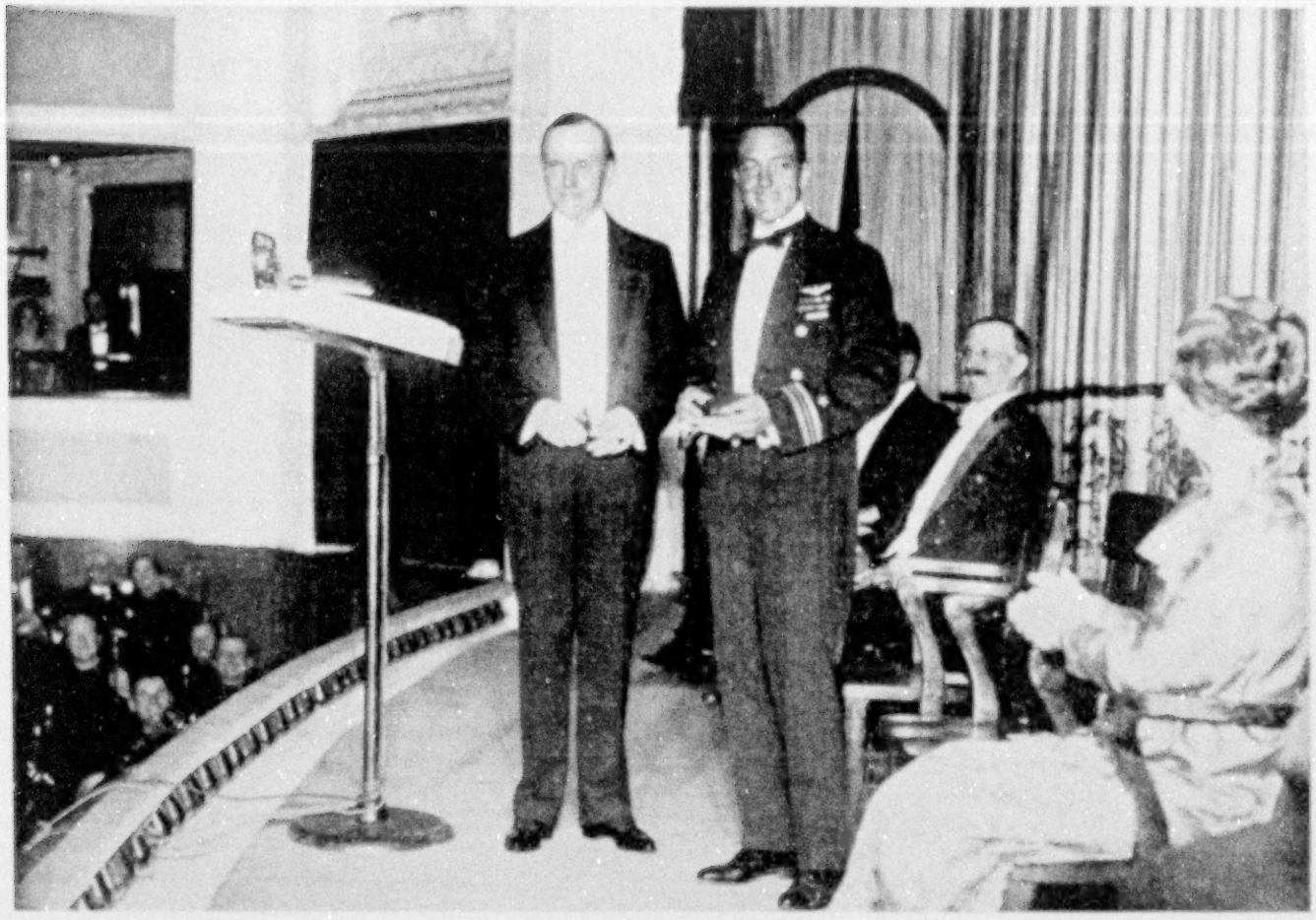
"On May 9, 1926, Floyd Bennett and I looked down upon the North Pole from our monoplane, completely verifying Peary's observations and demonstrating the feasibility of using airplanes in any part of the globe.

"Seventeen years ago Peary's trip to the North Pole and back kept him out of touch with civilization for more than four hundred days. Bennett and I left civilization early one morning and returned on the afternoon of the same day."

AIRPLANES EXPLORE THE TROPICS

Immediately upon his return Commander Byrd submitted his flight records and observations to the National Geographic Society, through the Secretary of the Navy. After an intensive study of these data by its technical experts, The Society concluded that Byrd's records substantiated in every particular his claim that he had reached the North Pole by airplane, and its highest award, the Hubbard Medal, was conferred upon Commander Byrd, and a gold medal upon Floyd Bennett.

In the Tropics, too, aviation is adding rapidly to our knowledge of the map. It was only with the aid of a hydroplane that the Rice Scientific Expedition of 1924



Photograph by International Newsreel

PRESIDENT COOLIDGE PRESENTS COMMANDER BYRD WITH THE HUBBARD GOLD MEDAL

This medal was awarded to Commander Richard Evelyn Byrd, first man to fly to the North Pole, before a distinguished audience of members and friends of the National Geographic Society.

Photograph by Jacob Gayer

SISTER PLANES OBSERVE ICE-BOUND SMITH SOUND

This is one of many photographs made by members of the MacMillan expedition, sent out by the National Geographic Society in cooperation with the U. S. Navy.

Photograph by Captain Frank Hurley

SIR ROSS SMITH CIRCLING OVER SYDNEY, AUSTRALIA

was able to make its exhaustive surveys of the Parima River country of Brazil. Writing in this Magazine for April, 1926, Captain Albert W. Stevens, of the United States Army Air Service and a member of the Rice party, said:

"The upper Amazon Basin is one of the last of the world's blind spots to succumb to the persevering curiosity of the explorer. Where the untrodden jungle presented a matted and almost impenetrable wall to men on foot, it surrendered its secrets readily to men in the sky. Our hydroplane served as the eyes of the expedition."

Already, aviation has rendered singular service to the science of geography. By photographs taken from the air it is today not at all difficult to get a more accurate grasp of terrain, rivers, shorelines, and highways than could be imparted by drawn maps or word pictures, and in one-tenth the time.

The Mexican-American Boundary Commission, for example, could really first see the great Colorado Delta problem *as a whole* by air pictures pieced together in mosaic form. In its aid and sponsoring of aviation, The Society has had constantly before it the value of air pictures in surveying for railroad, highway, irrigation, forestry, harbor work, and other engineering enterprises.

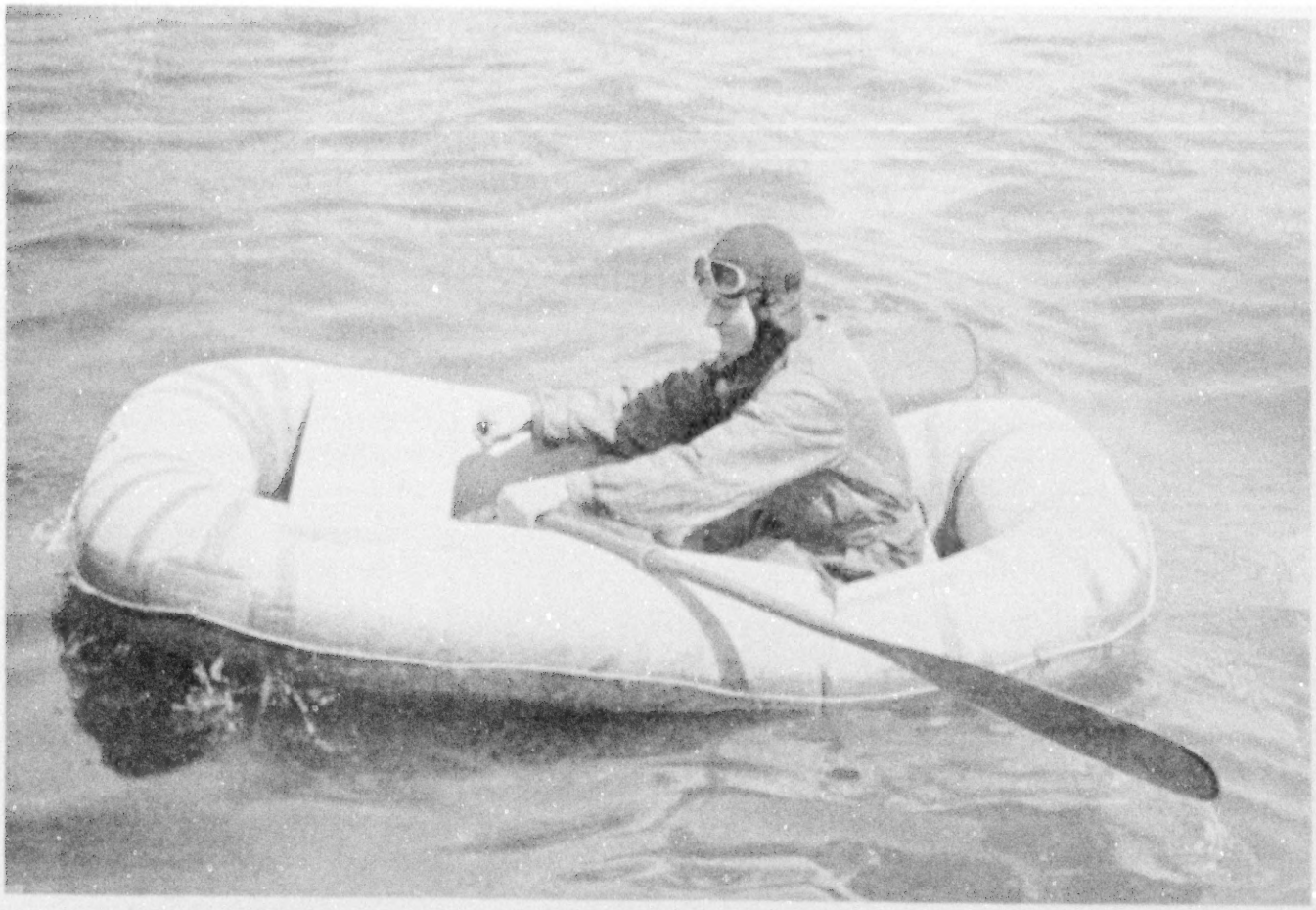
MANY PHASES OF AVIATION COVERED BY THE GEOGRAPHIC

To inform its members and the public of the rapid progress of air travel and the huge importance of aviation to many angles of modern life, The Society is tireless in its efforts. It combs the earth for fresh facts and photographs. In January, 1926, The Magazine printed an absorbing story of the Air Mail, the service that developed Lindbergh. "Canada from the Air," published October, 1926, is proving one of the most popular articles ever printed in this Magazine.

In general, four phases of aviation have been dealt with:

First. The origin of aircraft.

Second. Growth of the science of aviation. This phase is discussed in such articles as "Man's Amazing Progress in Conquering the Air," July, 1924; the dirigible *Shenandoah's* 9,000-mile flight from the Atlantic to the Pacific coast and return, in "Seeing America from the *Shenandoah*," January, 1925; Lieutenant John A. Macready's "The Non-Stop



Photograph by Harris and Ewing

COMMANDER BYRD IN RUBBER RAFT HE FIRST DEVISED FOR ARCTIC FLIGHTS

Flight Across America," July, 1924, and the story of his altitude flights, in "Exploring the Earth's Stratosphere," December, 1926; and helium, the incombustible gas, in "Helium, the New Balloon Gas," May, 1919.

Third. The use of aircraft in war, commerce, and industry, dealt with particularly in such articles as General William Mitchell's "America in the Air: The Future of Airplane and Airship, Economically and as Factors in National Defense," March, 1921; the account of a 6,500-mile tour over commercial aviation routes abroad, in "Looking Down on Europe," by Lieutenant J. Parker Van Zandt, U. S. A., March, 1925; a discussion of the probable importance of polar routes, in Vilhjalmur Stefansson's "The Arctic as an Air Route of the Future," August, 1922; and in a discussion of Egypt as one of the most important air-traffic centers in the Eastern Hemisphere, in "Flying Over Egypt, Sinai, and Palestine," September, 1926.

Fourth. The use of aircraft in geographic exploration. This phase has been described and pictured in such articles as Captain St. Clair Streett's "The First Alaskan Air Expedition," May, 1922; Commander Richard E. Byrd's story of his flights over Greenland and Ellesmere Island with the MacMillan Arctic Expedition of 1925, in "Flying Over the Arctic," November, 1925; and Commander MacMillan's own account of the expedition's work in "The MacMillan Arctic Expedition Returns," November, 1925.

COLONEL LINDBERGH AWARDED HUBBARD MEDAL

When for example Colonel Charles A. Lindbergh made his world-acclaimed nonstop flight from New York to Paris, The Trustees, on behalf of The Society's 1,100,000 members, awarded to him its highest honor, the Hubbard Gold Medal.

As a tribute to his own aviation achievements, The Society designated Commander Richard E. Byrd to notify Colonel Lindbergh of this award, and the citation took place at the breakfast given in Lindbergh's honor by the National Aëronautic Association, in Washington, June 13.

In awarding this medal to Colonel Lindbergh, the following letter was addressed to him by the President of the National Geographic Society:

Photograph by Maynard Owen Williams

ALBERT H. BUMSTEAD, CHIEF CARTOGRAPHER OF THE NATIONAL GEOGRAPHIC SOCIETY, EXPLAINING HIS SUN-COMPASS TO COMMANDER BYRD

June 9th, 1927.

MY DEAR COLONEL LINDBERGH:

The Board of Trustees of the National Geographic Society extends to you the congratulations and good wishes of its one million one hundred thousand members throughout the Nation upon the heroic service to the science of aviation that you have contributed by your solitary flight from New York to Paris on May 20-21, 1927.

In recognition of this contribution to the science of aviation, the Hubbard Medal, the highest gift of the National Geographic Society, has been awarded you.

The bestowal of the Hubbard Medal has been made but seven times in the thirty-nine years of existence of this scientific and educational institution. The others who have been thus honored by The Society are: Rear Admiral Robert E. Peary, Captain Roald Amundsen, Captain Robert A. Bartlett, Dr. Grove Karl Gilbert, Sir Ernest Shackleton, Dr. Vilhjalmur Stefansson, and Commander Richard E. Byrd, and on each occasion the presentation has been made by the President of the United States.

With renewed congratulations upon the signal service that you have rendered your country, and looking forward with pleasure to greeting you, I am, very sincerely yours,

(Signed)
GILBERT GROSVENOR,
President.

To meet its members' ever-increasing demand for full details of all great air adventures and achievements, The Society will publish, in early issues of its Magazine, various additional articles by world-famed flyers who have linked continents with paths through the air.

Sir Alan Cobham, famous British flyer, will write of his long air cruise from London to Australia, and his flight over Africa from the Cape to Cairo.

The American Army's "Good-Will Flight" to South America, a trip which took the Yankee flyers on an 18,000-mile swing around the southern continent, will be described by Major Herbert A. Dargue, U. S. A., who commanded this expedition.

Colonel Francesco de Pinedo, intrepid Italian airman, who flew from Rome to China and back, and covered nearly 49,000 air miles in a flight from Italy to Brazil, up to North America and then back home, will tell in this Magazine the story of his adventures.

The 8,000-mile air voyage of the *Norge* from Rome up over the ice-top of the world to Alaska is described by General Umberto Nobile, designer and pilot of this airship, in this issue.

Commander Byrd will write for The Society's journal the dramatic account of his European flight and tell in his own modest way the story of the air journey of himself and associates. All these articles will be richly illustrated by aërial and other illustrations taken along the great lines of international air commerce.

Ox Tail~
A soup of world-famous flavor

IN THE exclusive clubs and the fashionable hotels and cafes, Ox Tail Soup is a dish dearly prized by epicures. It has an appeal all its own.

Yet no hotel or club, no matter how elaborate, can rival the facilities of the famous Campbell's kitchens or match the skill and experience of Campbell's French chefs in the blending of delicious soups.

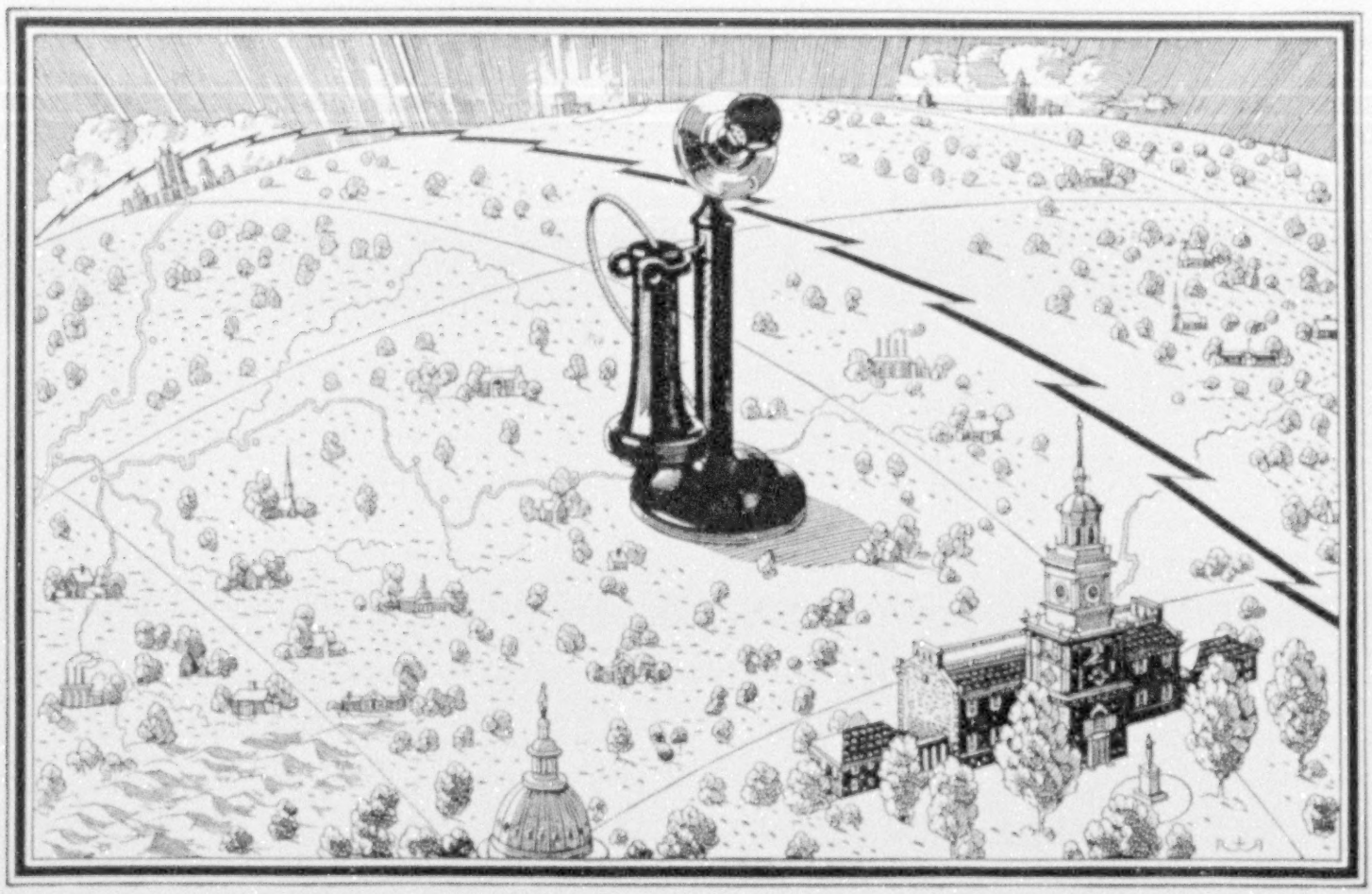
What a masterpiece they produce in Campbell's Ox Tail Soup. And what an opportunity it presents. You can now enjoy its world-famous flavor in your own home. Ox Tail is one of those soups which are seldom attempted in the home kitchen.

In this Campbell's blend are broth of selected ox tails and beef, sliced ox tail joints, tomato puree, diced carrots, yellow turnips, celery, onion, herbs and barley. How instantly your appetite responds!

12 cents a can

LOOK FOR THE RED-AND-WHITE LABEL

WITH THE MEAL OR AS A MEAL SOUP BELONGS IN THE DAILY DIET



The Traveler's Telephone

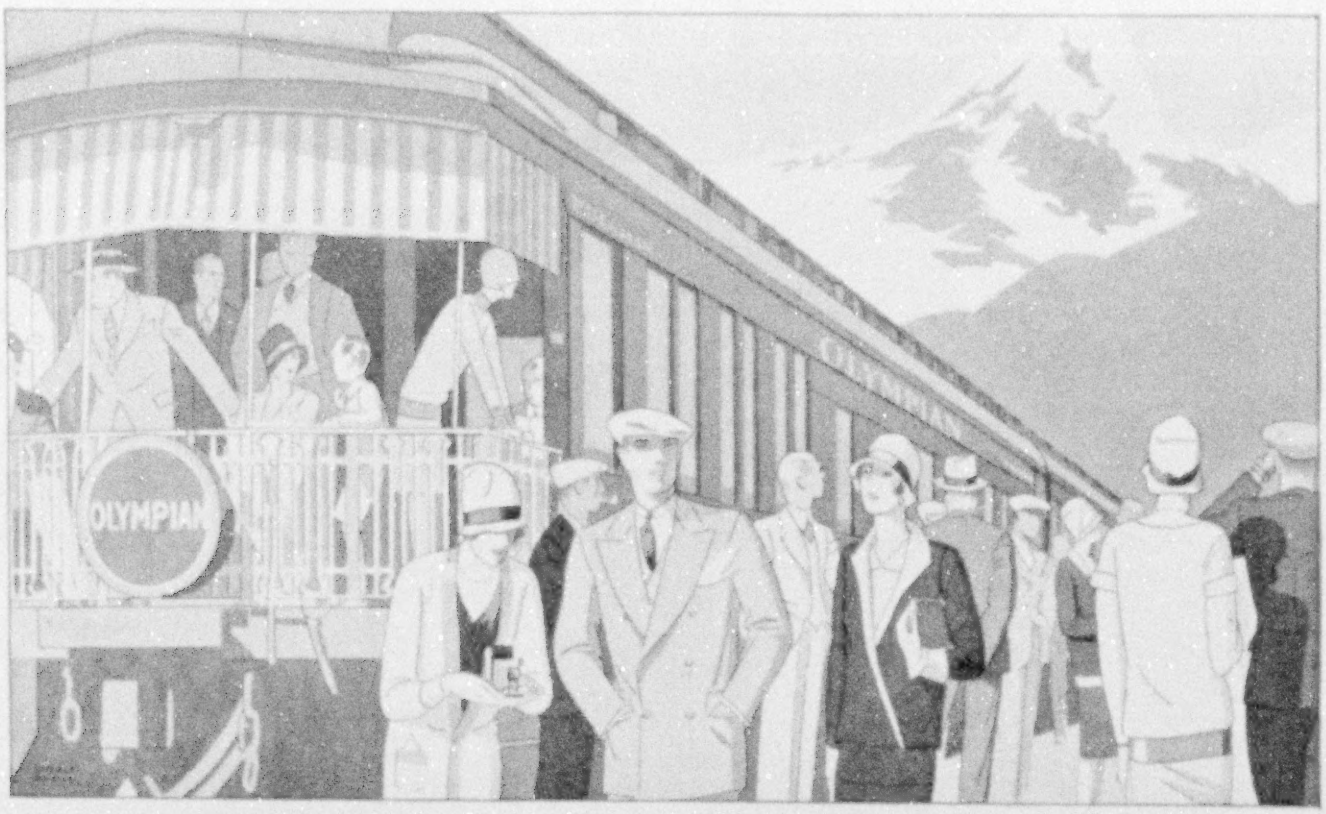
An Advertisement of
the American Telephone and Telegraph Company

AMERICANS are the greatest travelers in the world. They have knit the country together by steel rails and made it the largest and most prosperous business community the world has ever seen. Business, friendship and political solidarity are maintained by personal touch, by travel and the telephone. Wherever the business man goes in this country, be it thirty miles or three thousand, he is still within earshot of his office, his family and his friends. He can get them and they can get him, and for the longest call in the United States the day rate is only $12 and the night rate is only $8.

For the Bell Telephone System is an idea in force nationally. All the instruments are designed in the largest industrial laboratory in the world and made in the same factories to the one standard of fitness. All of the telephone builders, repairers and operators are trained to the same ideal and aim; stated by President Walter S. Gifford as:

"A telephone service for the nation, so far as humanly possible free from imperfections, errors or delays, and enabling at all times anyone anywhere to pick up a telephone and talk to anyone else anywhere else, clearly, quickly and at a reasonable cost."

NEW OLYMPIAN—*most modern, most luxurious in all transportation!*



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To GRASP the significance of the great forward leap railroad transportation has recently taken, you must see and ride in the *New Olympian!*

The famous Olympian was the first transcontinental limited to link Chicago with Seattle-Tacoma. Now, the *New Olympian* opens another era of transportation with the finest equipment ever run on rails. It is literally the most modern and most luxurious transcontinental limited in the world.

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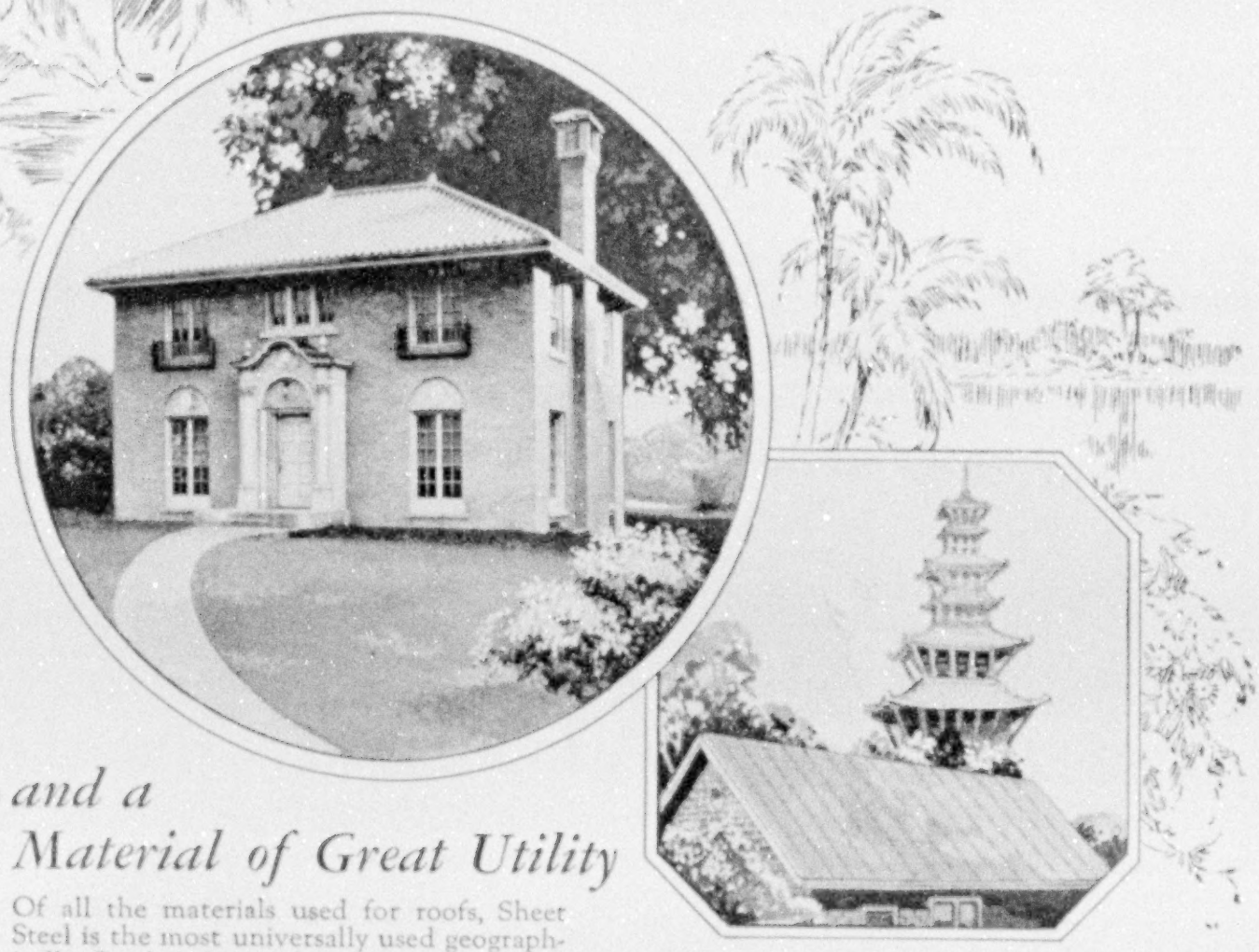
The Roof of the World



—and a Material of Great Utility

Of all the materials used for roofs, Sheet Steel is the most universally used geographically. Steel is the roof of the world. Travel where you will throughout America, to Europe, to the remote places, Manila, Singapore and old Rangoon—anywhere you wander almost—you will find buildings, safely and beautifully roofed with Sheet Steel.

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Not until you drive it yourself, can you understand why, from its very introduction more than three years ago, every other motorcar builder in its price field has striven in vain to equal the marvelous performance which has built Chrysler's great reputation.

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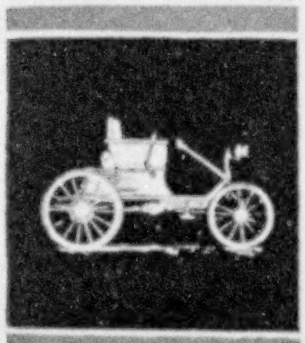
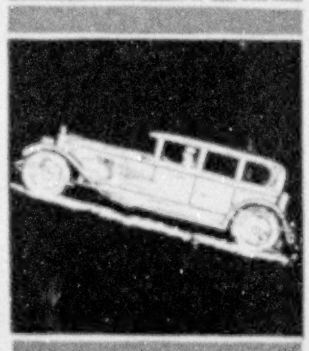
CHRYSLER 70

DRIVE A CHRYSLER TO PROVE A CHRYSLER

Automobiles have improved *but*—

what about gasoline?





It is a far cry from the "horseless buggy" of yesterday to the automobile of today. But the first cars and the latest cars are alike in one fundamental respect: *both depend on gasoline for fuel.*

Gasoline is not a perfect fuel. It has always had one inherent fault. It explodes too quickly ("knocks") as temperature and compression increase.

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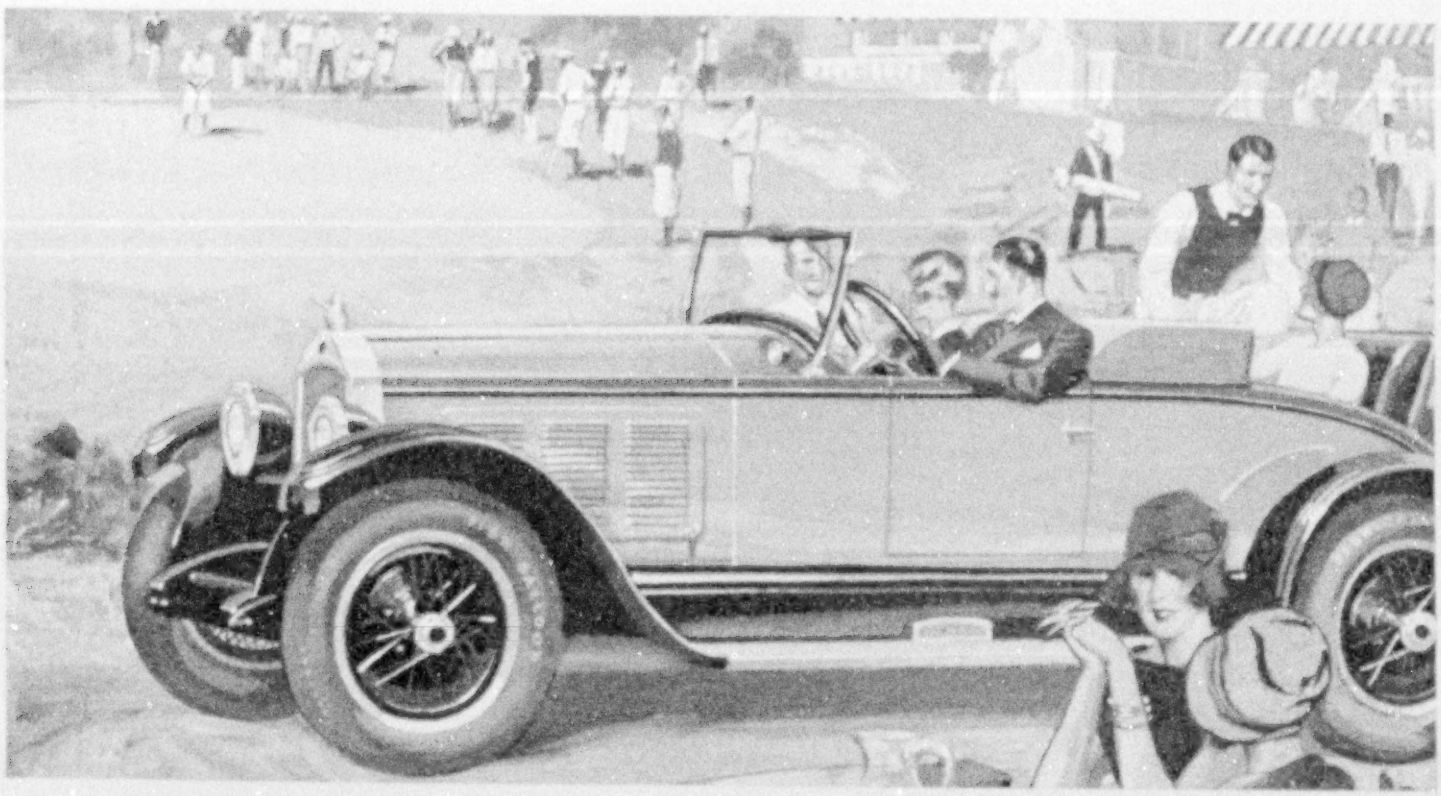

"85,000 miles - no repairs"

So writes one of the many thousands of enthusiastic Willys-Knight owners concerning his—*typical*—carefree motoring experience. The car here illustrated—the Great Six Varsity Roadster, 4-passenger capacity—is one of the models which have brought the Willys-Knight line to its high position in the public mind. And now, new reduced prices make the Great Six more than ever the leader in fine car values. Only the Willys-Knight offers *all* these important advantages:

The Knight Engine—Constantly gaining in smoothness, quietness, power. The only type that definitely *improves* with use.

7-Bearing Crankshaft—Banishes vibration.

Skinner Rectifier—The device that prevents dilution or contamination of oil.

4-Wheel Brakes—Positive, mechanical-type—act in a flash. For maximum driving safety.

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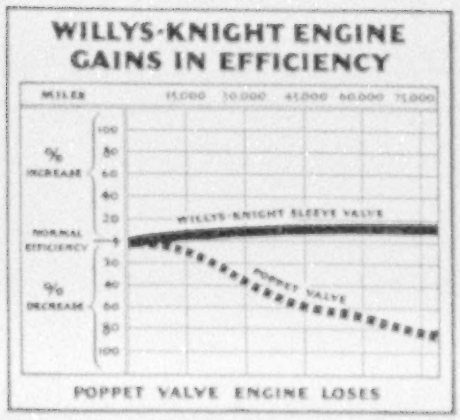
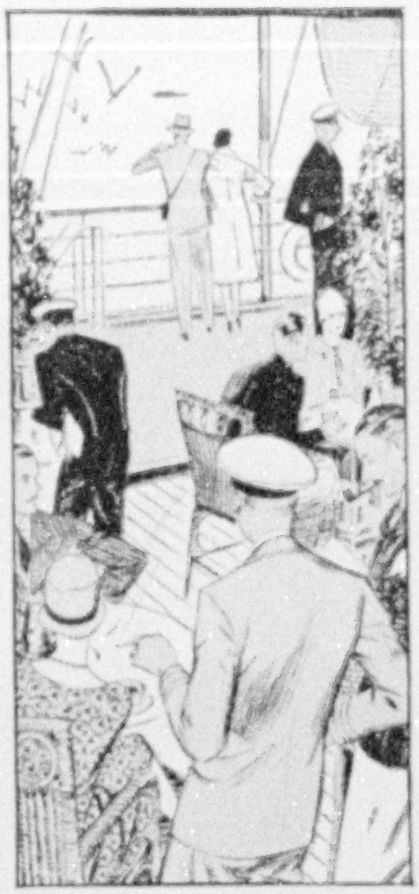
THE ENGINE IMPROVES WITH USE — IN SMOOTHNESS, QUIETNESS AND ECONOMY



"70" Willys-Knight Six, $1295 to $1495. Willys-Knight Great Six, reduced prices, $1750 to $2950. Prices f. o. b. factory and specifications subject to change without notice. Willys-Overland, Inc., Toledo, Ohio. Willys-Overland Sales Co., Ltd., Toronto, Canada.



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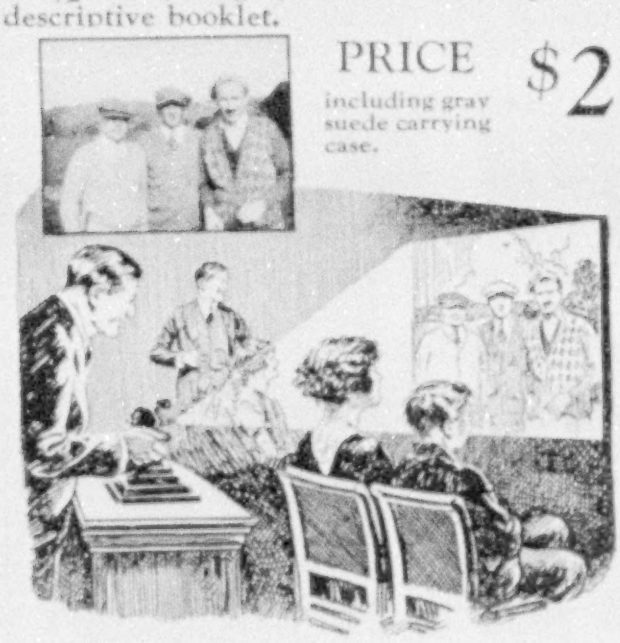

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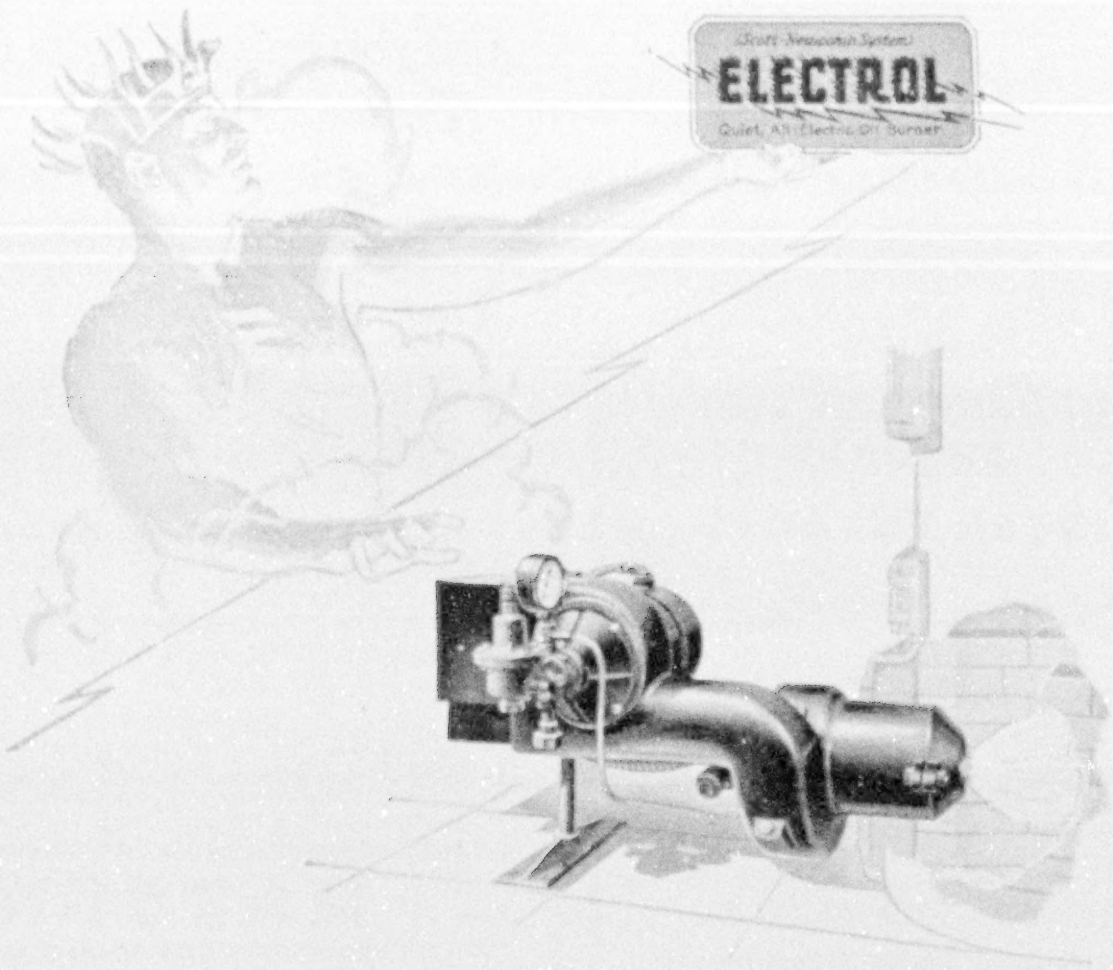

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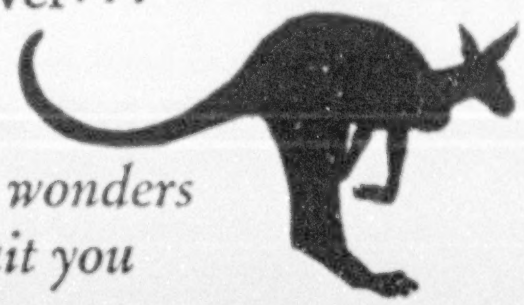

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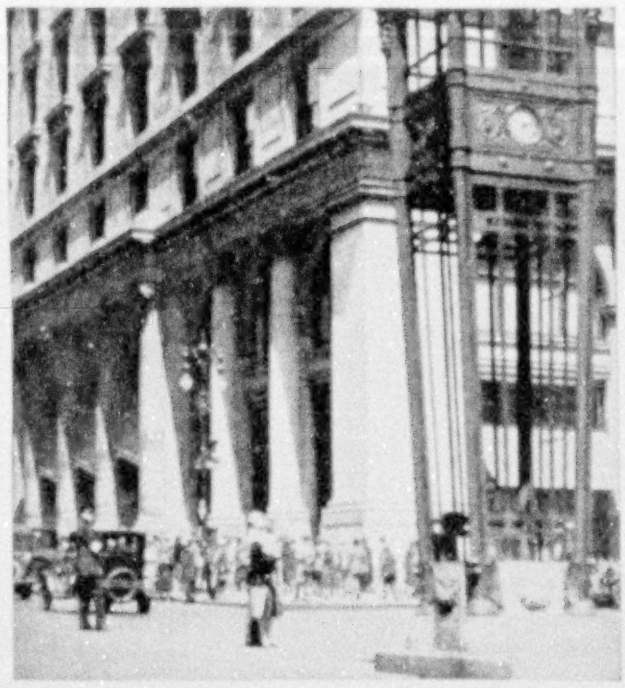

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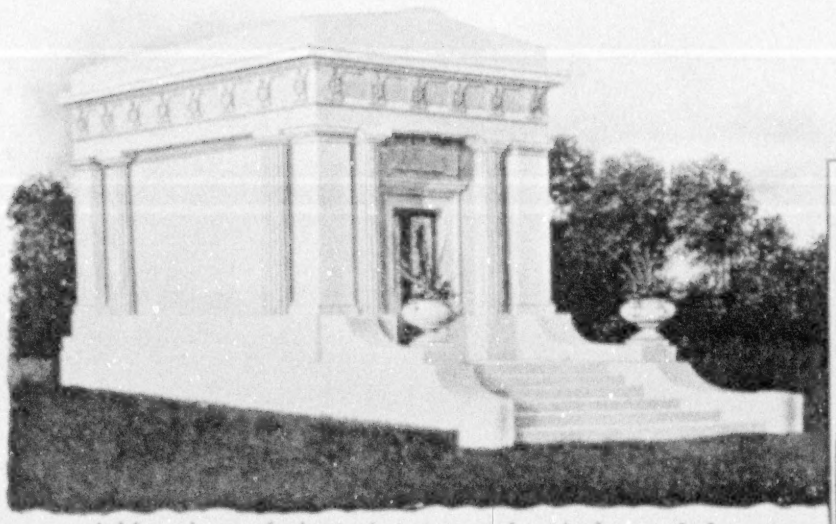

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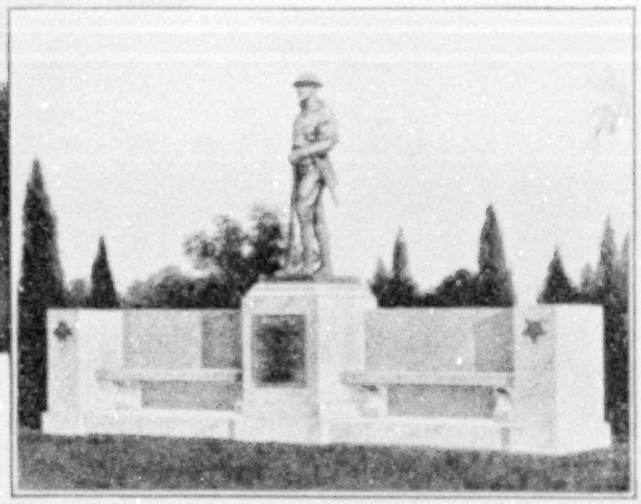

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Name and Address of Nominating Member

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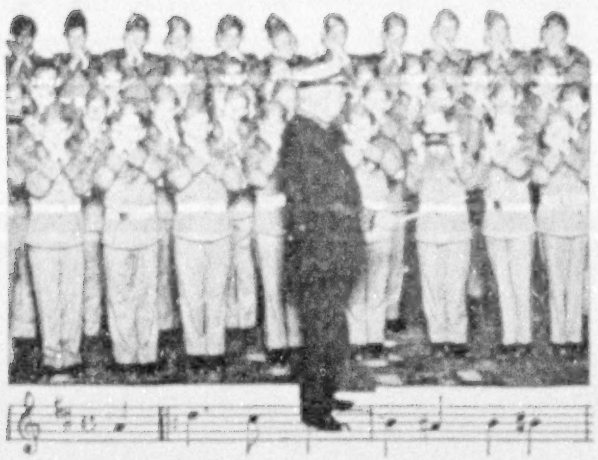

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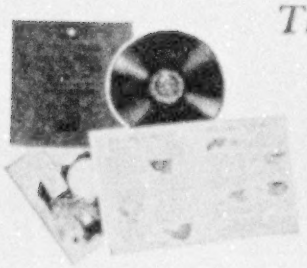

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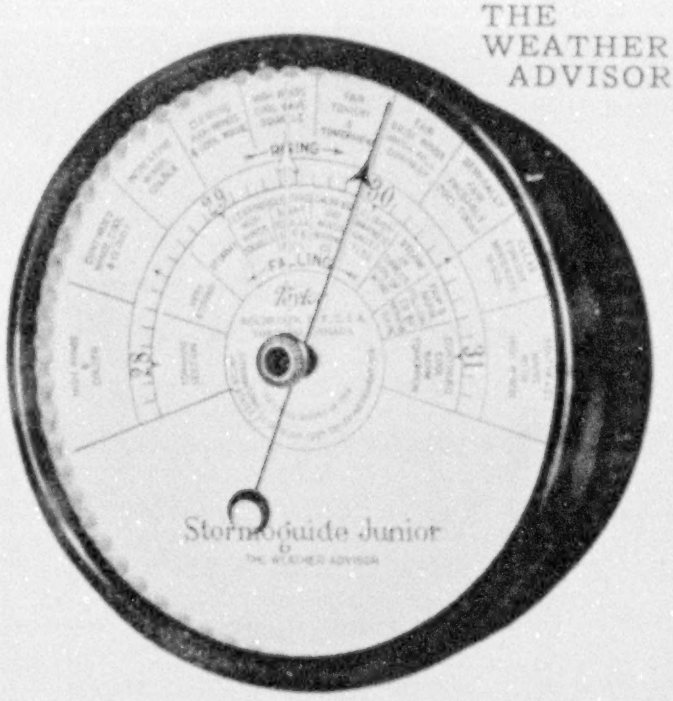

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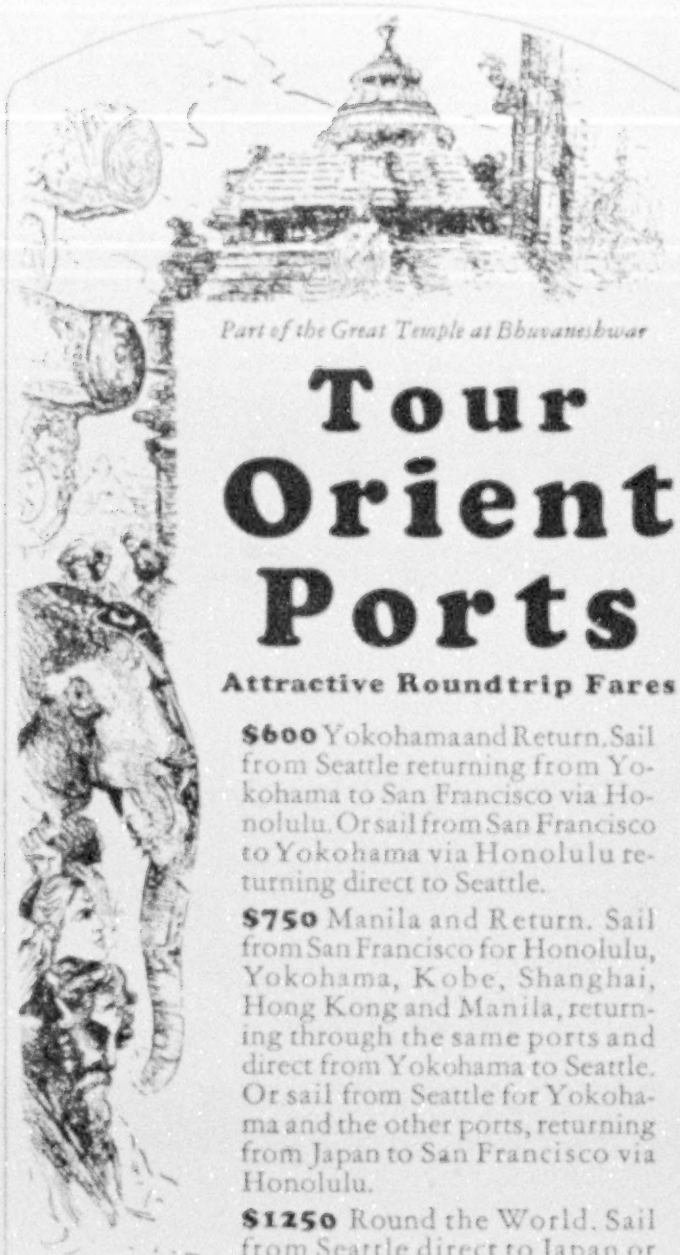

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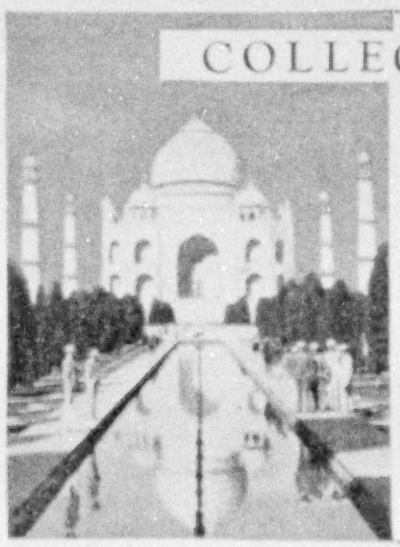

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Nat. Geo. 8-27

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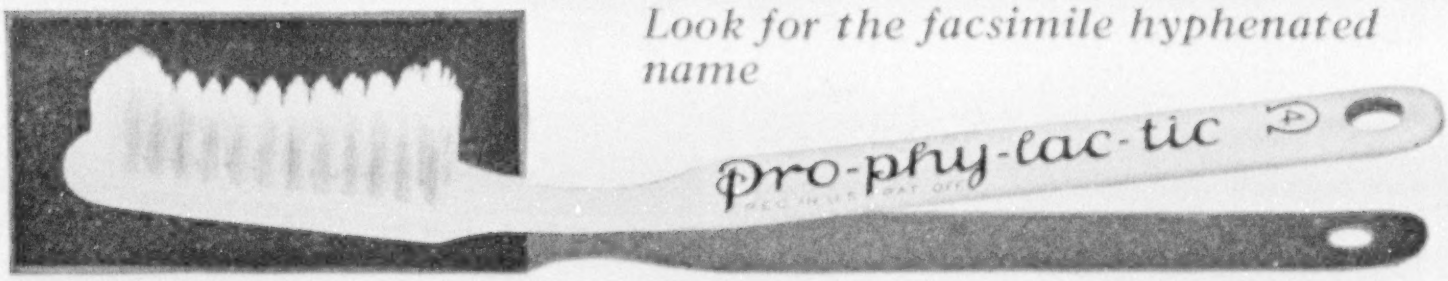

Look for the facsimile hyphenated name

Correct Evening Jewelry

Formal attire and *correctness* invariably go together. To the well-informed man, omission of a single detail is intolerable. For instance, his studs, links and vest buttons *always* match—an inflexible rule of convention. Naturally, his choice is Krementz Evening Jewelry. It is correct! The rich designs and varied shapes, the fine quality and finish, have a wonderful appeal. Beautifully cased—a Krementz set is the ideal gift. At the better shops or write us direct.

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And every cup of G. Washington's Coffee has that fine flavor that identifies real quality coffee correctly blended and properly made.

G. Washington's Coffee is an important achievement in the art of genteel living. It is a finished product; all the preparation necessary to the perfect enjoyment of it has been supervised by experts before it goes into your home. It has been "made" by percolating; the water extracted by vacuum-drying, and is ready for you to serve. Simply add hot or cold water.

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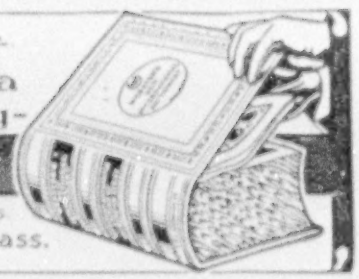

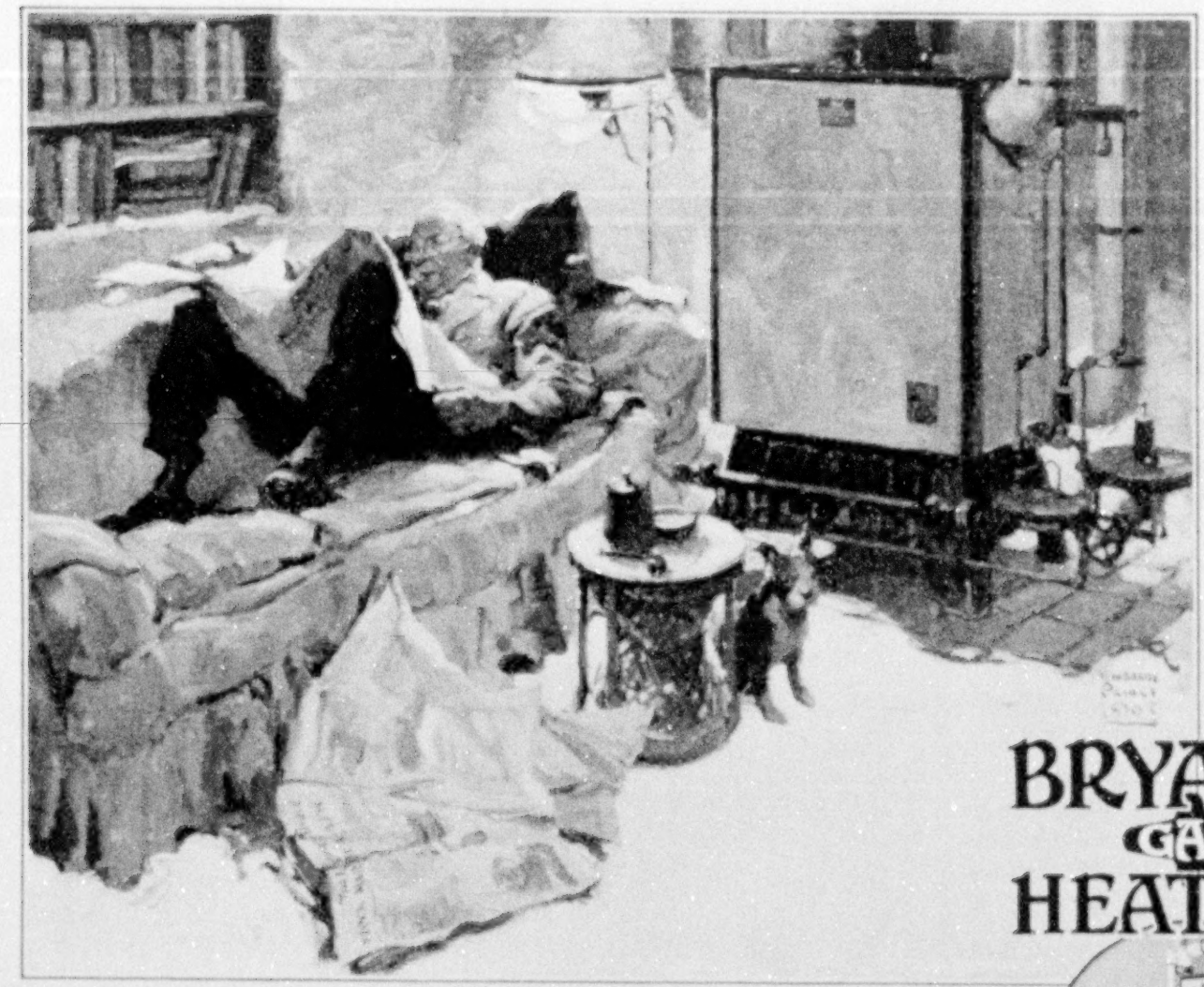

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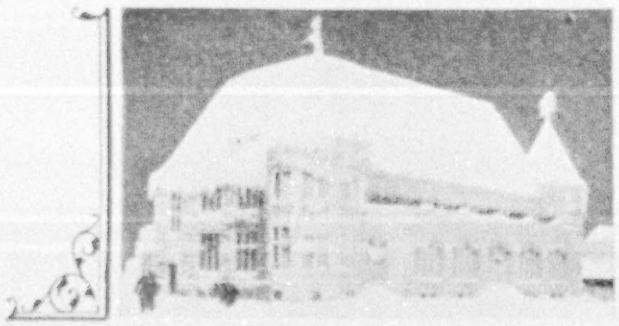

Table Rock House, built at a cost of $500,000 by the Queen Victoria Niagara Falls Park Commission, is the official entrance to the scenic tunnel under the Canadian side of the falls.

Findlay & Foulis, Architects

Taming Niagara

with Oilomatic Heat-

Oil-O-Matic fights a daily battle to keep this building from being crushed like paper by Niagara's mighty ice deposit.

TWO Oil-O-Matics in the boiler room of Table Rock House are more than a match for unharnessed Niagara. So no heating problem in your home can overtax its capacity.

On the very brink of the Falls on the Canadian side stands Table Rock House. Day and night the year around it is bathed in the heavy mist arising from the roaring cataract. In winter this mist instantly freezes, coating everything with solid ice.

If left to accumulate on the roof of this edifice, reinforced concrete, steel girders and masonry would flatten out under its ponderous weight. How Oil-O-Matic prevents this, is your assurance of dependable, uniform heat in your own home.

Under the copper roof are coils of steam pipes, radiating heat to the outside surface. As the ice forms it is melted and drained away. So not only must the two Oil-O-Matics heat up the outdoors but also the three floors of this public building, through which 5,000 visitors pass in a single day. No more urgent need of dependable heat will ever be found in your own home.

In addition, these same burners furnish all the domestic hot water for the refectory and baths the year around, dispose of all garbage in the incinerator in the boiler and serve as a bulwark of defense against any sudden cold spell in the late Spring or early Fall, that might bring disaster. As you stroll through the maze of rooms, glistening marble and crystal clear windows certify to the absolute cleanliness of Oilomatic heat. In the homes of all the other many thousands of users you will find this equally true.

Niagara's Mist Coats Everything With Ice

For eight years Oil-O-Matic has been rendering the same dependable service experienced at Table Rock House. It is not surprising that today Oil-O-Matic is the most widely enjoyed oil burner in the world. In 1926 Oil-O-Matic sales were almost equal to the combined sales of any three other oil burners.

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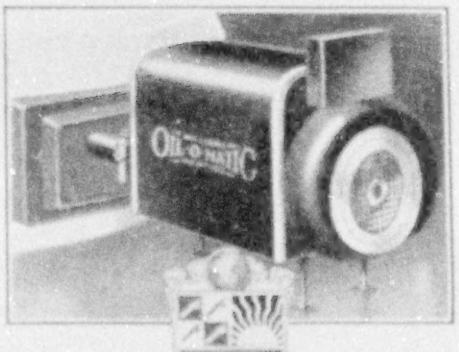

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With a record of over 1,750,000 miles in safety in 1926 in private and commercial flying, Wright Engines today stand preeminent in the aeronautical field.

The assurance of safety has been the only point which has deterred many persons from owning an airplane for pleasure or business. The past two year record of Wright Engines and especially designed Wright Engined planes, however, has finally removed any further uncertainty. Today dependable pilots under government license are immediately available for regular employment to teach you to fly while piloting your plane.

Well proved planes from the designs of leading American manufacturers, powered with Wright Engines for every type of flying, including open sport planes, closed family and passenger planes, cargo planes, seaplanes, planes that take off from land or water, or big tri-motor airliners as comfortable as a yacht are available for your inspection and consideration at reasonable cost.

That's why *More Pilots fly them!*

Your plane is ready!

In the meantime write for the interesting non-technical Bulletin No. 17L, described elsewhere.

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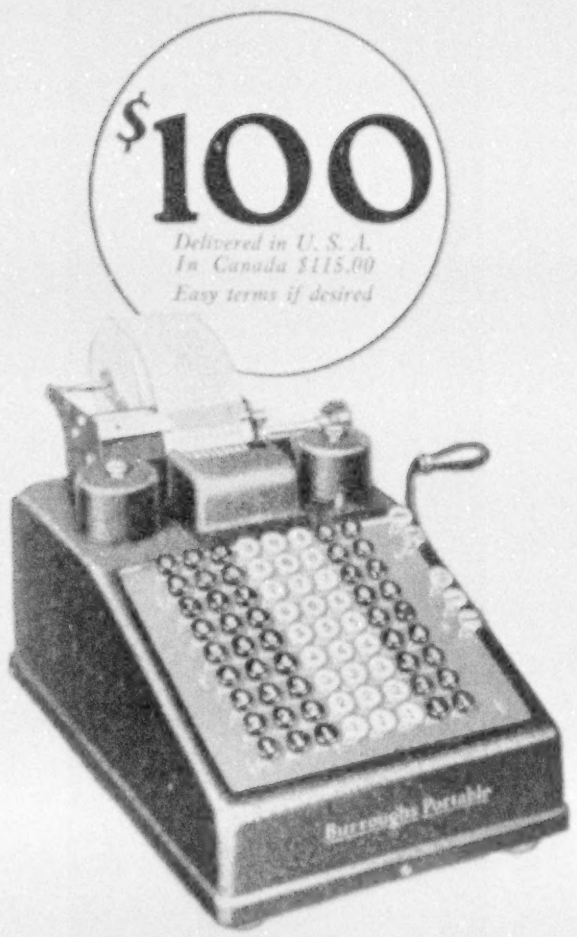

Professional and business men and women are finding the Burroughs Portable Adding Machine as essential in their offices as a typewriter.

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